THE POTTERY OF THE LATER PREHISTORIC PERIOD IN THE WESTERN ISLES OF SCOTLAND.

Patrick G. Topping

Ph.D.
University of Edinburgh
March 1985

DECLARATION

I declare that the work undertaken in this study and the composition of the thesis were carried out solely by myself.

Acknowledgments.

My greatest debt is to my two supervisors, Professor D.W. Harding and Dr. A.B. MacKenzie. Professor Harding has provided advice, encouragement and above all intellectual stimulus, both during the course of this research and in the period prior to its commencement. Dr. A.B. MacKenzie spent many hours guiding me through the use of the complex machinery at the Scottish Universities Research and Reactor Centre. His patience never faltered and the criticism and advice which he gave to an innumerate research student were much appreciated.

I am also indebted to the staff of the National Museum of Antiquities of Scotland and of the Hunterian Museum. In particular Dr. D.V. Clarke, Mr. T. Cowie, Mr. I. Scott and Dr. E.W. MacKie have been most helpful in permitting me to take samples from pottery sherds within their collections. Dr. MacKie has also very generously given me permission to reproduce unpublished proofs from his excavation at Dun Ardtreck, Skye.

I am also very grateful to the Scottish Development Department (Ancient Monuments) and in particular to Mr. J. Barber, Mr. M. Brooks and Mr. P. Strong for giving me access to the pottery and unpublished plans of Balelone, North Uist.

Pottery and plans were also very kindly given to me by the Department of Archaeology, University College Cardiff and I am especially grateful to Dr. A. Lane and Mr. P. Berridge for guiding me through the collections from Sollas, North Uist.

The X-ray diffraction analysis was carried out for me by Professor Craig and Mr. G. Angell of the Geology Department, University of Edinburgh.

Mr. G. Thomas drew the map of the Western Isles (Fig. 1), the examples of vessel form and decoration (Fig. 2A) and also the illustrations of the sherds from Sollas (Fig. 230).

I much appreciated the help provided by Mr. A. Alexander in the use of the Edinburgh Regional Computer Centre's 2976 mainframe and am grateful to him for writing the program which converted the NAA data to ratios. More general computing help was provided by members of the ERRC staff, in particular John Murison greatly assisted me with the text layout programs.

Much useful statistical advice was provided by Miss I. Coomaraswamy and Miss J. Lindsey.

The research was carried out during the tenure of a Major Scottish Studentship awarded by the Scottish Education Department.

Preface

During the research leading to this thesis it became apparent that one of the factors which had hindered previous interpretations of the pottery was the varying manners in which excavators described and classified the sherds recovered from their sites. It is not claimed that the descriptions of the sherds contained in appendix A are any less subjectively described, but rather that as a consequence of having been examined by one individual there should be a greater level of uniformity in the description and terminology.

Should greater detail than that given in the main text be required for any particular sherd in terms of context, decorative features, place of publication etc., this may be found by looking up the relevent section of appendix A where the sherd numbers are the same as those used in the text, as indeed are the illustration numbers in the figures. It is realized that that the appendices are large, this is in part so that the main text could be compressed, and to that end much of the results of the neutron activation analysis have also been displayed in figures. The possibility of including the appendices on microfiche was considered but rejected on the grounds that the level of accessibility of the information to the reader was reduced.

Abstract

The primary interest in the Later Prehistoric period in the Western Isles of Scotland has traditionally lain in the examination and description of its structures. During more recent years attention has swung towards analysis of the function of sites and towards a re-examination of the small finds. Study of the small find classes indicated that the pottery might contain potential for further research, because it was ubiquitous in the archaeological record and had previously been used as an indicator of differentiation in function, a physical proof of trade/exchange links and had been heavily relied on for chronological definition.

Research was undertaken to examine two different but connected aspects of the Hebridean later prehistoric ceramic tradition. Firstly, was the pottery capable of supporting the chronological and cultural models which were currently being derived from it, and secondly were there potentially useful patterns within the clay fabric of the various forms and decorative styles, which had not been previously recognized, and which might provide an alternative and perhaps more useful approach to the definition of later prehistoric social processes in the Hebrides? The answers to these questions were sought by a twin approach of reappraising existing pottery typologies and by chemical analysis of sherds through neutron activation.

The conclusion was reached that the traditional pottery typologies were over simplified and offered a more structured framework of chronological horizons and wares than really existed in the archaeological record. The analytical part of the research demonstrated that in almost every case no phase within a site and no context within a phase possessed its own exclusive clay source and/or method of manufacture. Two other patterns which were observed, however, were that clay objects associated with metalworking tended to be outliers in the analysed pottery populations and secondly that there was a chemical distinction between the more southerly islands of Iona and Tiree as against the others further north in the Hebridean chain. The general conclusion which was drawn from the results was that pottery was locally made and locally distributed.

Abbreviations

General

ERCC	Edinburgh Regional Computer Centre
Geli	Germanium lithium
IAEA	International Atomic Energy Agency
NMAS	National Museum of Antiquities of Scotland
NAA	Neutron activation analysis
ppm	parts per million
SURRC	Scottish Universities Research and Reactor Centre

Elements

Ce	Cerium
Co	Cobalt
Cr	Chromium
Cs	Cesium
Eu	Europium
Fe	Iron
Hf	Hafnium
K	Potassium
La	Lanthanum
Lu	Lutetium
Na	Sodium
Rb	Rubidium
Sb	Antimony
Sc	Scandium
Sm	Samarium
Ta	Tantalum
Tb	Terbium
Th	Thorium

CONTENTS

Figures

Figure numbers and titles

1: Map of the Western Isles of Scotland showing the sites from which pottery was analysed.
2a: Terminology and features of the main stylistic and decorative types described in the text.
2b: Key for fig. 2a of rim, decorative and base types
3: The results of the analysis of ten samples from a single vessel from Oakbank crannog.
4: The values from which the mean for the Edinburgh standard reference clay were derived.
5: Values obtained for IAEA SL-1.
6: The values obtained by NAA for the IAEA clay and those provided by the IAEA as reference concentrations.
7: Precision.
8: Elemental isotopes showing typical percentage errors
9: Elemental composition of HI-DI no 6 stainless steel shafts by manufacturers specifications
10: Elemental composition of HI-DI no 6 burr and part shaft by NAA
11: Contamination of chromium from diamond burr
12: Dendrogram produced from the raw data obtained by NAA for the sampled Hebridean clay beds.
13: Dendrogram produced from the ratios to scandium derived from the raw data.
14: Dendrogram produced from the same ratios as Fig. 13 but labelled by island of origin.
15: Dendrogram produced from the raw data obtained by NAA for the IAEA and SURRC reference clays.
16: Dendrogram produced from the ratios to scandium derived from the raw data obtained for the reference clays.
17: Dendrogram produced from the ratios to scandium derived from the raw data, including chromium.
18: SURRC twosample 't' test.
19: IAEA twosample 't' test.
20: Loch Tay twosample 't' test.
21: Loch Ard twosample 't' test.
22: Loch Tay and Loch Ard twosample 't' test.
23: Balephuil twosample 't' test.
24: Sollas and Dun Carloway twosample 't' test.
25: Sollas, Dun Carloway and Foshigarry twosample 't' test.
26: Balelone, Dun Cul Bhuirg and Dun Mor Vaul twosample 't' test.
27: Dun Cul Bhuirg site plans and pottery rim profiles.
28: Dun Cul Bhuirg pottery (after Ritchie and Lane 1981).
29: Dun Cul Bhuirg pottery. Scale 1:2.
30: Dun Cul Bhuirg pottery. Scale 1:2.
31: Dendrogram of the sampled sherds from Dun Cul Bhuirg.
32: Dendrogram of the sampled sherds from Dun Cul Bhuirg, labelled by site and by context.
33: Dun Cul Bhuirg twosample 't' test.
34: Dun Cul Bhuirg twosample 't' test.
35: Dun Cul Bhuirg cluster 1.

Figure numbers and titles

36: Dun Cul Bhuirg cluster 2.
37: Dun Cul Bhuirg cluster 3.
38: Dun Mor Vaul pre broch levels.
39: Dun Mor Vaul post broch levels.
40: The stratigraphic relationship of contexts at Dun Mor Vaul (after Mackie 1974).
41: Dun Mor Vaul C-14 dates calibrated by MacKie.
42: Dun Mor Vaul C-14 dates calibrated by Klein curve.
43: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
44: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
45: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
46: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
47: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
48: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
49: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
50: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
51: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).
52: Dendrogram of sampled pottery from Dun Mor Vaul.
53: Dendrogram of sampled pottery from Dun Mor Vaul, labelled by context.
54: Dendrogram of sampled pottery from Dun Mor Vaul, labelled by phase.
55: Dun Mor Vaul twosample 't' test.
56: Dun Mor Vaul twosample 't' test.
57: Dun Mor Vaul twosample 't' test.
58: Dun Mor Vaul twosample 't' test.
59: Dun Mor Vaul twosample 't' test.
60: Dun Mor Vaul twosample 't' test.
61: Dun Mor Vaul twosample 't' test.
62: Dun Mor Vaul cluster 1.
63: Dun Mor Vaul cluster 2.
64: Dun Mor Vaul cluster 3.
65: Dun Mor Vaul cluster 4.
66: Dun Mor Vaul cluster 5.
67: Dun Mor Vaul cluster 6.
68: Dun Mor Vaul cluster 7.
69: Dun Mor Vaul cluster 8.
70: Dun Mor Vaul cluster 9.
71: Dun Mor Vaul cluster 10.
72: Balevullin site plan (after Mackie 1963).
73: Balevullin pottery. Scale 1:4 (after Mackie 1963).
74: Balevullin pottery. Scale 1:4 (after Mackie 1963).
75: Balevullin pottery. Scale 1:4 except no. 103 which is 1:12 (after Mackie 1963).
76: Dendrogram of sampled sherds.
77: Dendrogram of sampled sherds, labelled by context.
78: Balevullin twosample 't' test.

Figure numbers and titles

79: Balevullin twosample 't' test.
80: Balevullin cluster 1.
81: Balevullin cluster 2.
82: Balevullin cluster 3.
83: Balevullin cluster 4.
84: Balevullin probable outliers.
85: Tigh Talamhanta site plan (after Young 1953).
86: Tigh Talamhanta pottery. Scale 1:4 (after Young 1953).
87: Tigh Talamhanta pottery. Scale 1:3 (after Young 1953).
88: Tigh Talamhanta pottery. Scale 1:2 (after Young 1953).
89: Tigh Talamhanta pottery. Scale 1:3 (after Young 1953).
90: Tigh Talamhanta clay moulds. Scale 1:4 (after Young 1953).
91: Dendrogram of sampled sherds.
92: Dendrogram of sampled sherds, labelled by context.
93: Tigh Talamhanta twosample 't' test.
94: Tigh Talamhanta twosample 't' test.
95: Tigh Talamhanta twosample 't' test.
96: Tigh Talamhanta twosample 't' test.
97: Tigh Talamhanta twosample 't' test.
98: Tigh Talamhanta cluster 1.
99: Tigh Talamhanta cluster 2.
100: Tigh Talamhanta cluster 3.
101: Tigh Talamhanta cluster 4.
102: Tigh Talamhanta cluster 5.
103: Tigh Talamhanta cluster 6.
104: Tigh Talamhanta cluster 7.
105: Dun Cuier site plan (after Young 1956).
106: Dun Cuier pottery. Scale 1:3 (after Young 1956).
107: Dun Cuier pottery. Scale 1:3 (after Young 1956).
108: Dun Cuier pottery. Scale 1:3 (after Young 1956).
109: Dun Cuier pottery. Scale 1:2 (after Young 1956).
110: Dun Cuier pottery. Scale 1:2 (after Young 1956).
111: Dun Cuier pottery. Scale 1:2 (after Young 1956).
112: Dun Cuier pottery from later levels. Scale unknown (after Young 1956).
113: Dendrogram of sampled sherds.
114: Dendrogram of sampled sherds, labelled by context.
115: Dun Cuier twosample 't' test.
116: Dun Cuier twosample 't' test.
117: Dun Cuier twosample 't' test.
118: Dun Cuier cluster 1.
119: Dun Cuier cluster 2.
120: Dun Cuier cluster 3.
121: Dun Cuier cluster 4.
122: Dun Cuier cluster 5.
123: Dun Cuier cluster 6.
124: A Cheardach Mhor phase 1 and 1A site plan (after Young and Richardson 1960).
125: A Cheardach Mhor stratigraphy of phases (after Young and Richardson 1960).
126: A Cheardach Mhor phases 1-5 site plan (after Young and and Richardson 1960).
127: A Cheardach Mhor pottery. Scale 1:3 (after Young and and Richardson 1960).

Figure numbers and titles

128: A Cheardach Mhor crucibles. Scale 1:2 (after Young and and Richardson 1960).
129: A Cheardach Mhor pottery. Scale 1:4 (after Young and and Richardson 1960).
130: A Cheardach Mhor pottery. Scale 1:4 (after Young and and Richardson 1960).
131: Dendrogram of sampled sherds.
132: Dendrogram of sampled sherds, labelled by phase and context.
133: A Cheardach Mhor twosample 't' test.
134: A Cheardach Mhor twosample 't' test.
135: A Cheardach Mhor twosample 't' test.
136: A Cheardach Mhor twosample 't' test.
137: A Cheardach Mhor twosample 't' test.
138: A Cheardach Mhor twosample 't' test.
139: A Cheardach Mhor twosample 't' test.
140: A Cheardach Mhor twosample 't' test.
141: A Cheardach Mhor cluster 1.
142: A Cheardach Mhor cluster 2.
143: A Cheardach Mhor cluster 3.
144: A Cheardach Mhor cluster 4.
145: A Cheardach Mhor cluster 5.
146: A Cheardach Mhor cluster 6.
146 A: A Cheardach Mhor cluster 7.
146 B: A Cheardach Mhor cluster 8.
147: A Cheardach Mhor cluster 9.
148: A Cheardach Mhor cluster 10.
149: A Cheardach Mhor cluster 11.
150: A Cheardach Bheag site plan (after Fairhurst 1971).
151: A Cheardach Bheag phases (after Fairhurst 1971).
152: A Cheardach Bheag pottery. Scale 1, 2 and 4 1:4; 7, 8, 11 and 13 1:2 (after Fairhurst 1971).
153: A Cheardach Bheag pottery. Scale 1:2 (after Fairhurst 1971).
154: A Cheardach Bheag pottery. Scale 1:2 (after Fairhurst 1971).
155: A Cheardach Bheag pottery. Scale 1:2 (after Fairhurst 1971).
156: Dendrogram of sampled sherds.
157: Dendrogram of sampled sherds, labelled by contexts.
158: A Cheardach Bheag twosample 't' test.
159: A Cheardach Bheag twosample 't' test.
160: A Cheardach Bheag twosample 't' test.
161: A Cheardach Bheag twosample 't' test.
162: A Cheardach Bheag twosample 't' test.
163: A Cheardach Bheag twosample 't' test.
164: A Cheardach Bheag twosample 't' test.
165: A Cheardach Bheag twosample 't' test.
166: A Cheardach Bheag twosample 't' test.
167: A Cheardach Bheag twosample 't' test.
168: A Cheardach Bheag cluster 1.
169: A Cheardach Bheag cluster 2.
170: A Cheardach Bheag cluster 3.
171: A Cheardach Bheag cluster 4.
172: A Cheardach Bheag cluster 5.
173: A Cheardach Bheag cluster 6.

Figure numbers and titles

Figure numbers and titles

229: Sollas site plan.
230: Sollas pottery.
231: Dendrogram of the sampled sherds.
232: Dendrogram of the sampled sherds, by contexts.
233: Sollas twosample 't' test.
234: Sollas twosample 't' test.
235: Sollas twosample 't' test.
236: Sollas twosample 't' test.
237: Sollas cluster 1.
238: Sollas cluster 2.
239: Sollas cluster 3.
240: Sollas cluster 4.
241: Sollas outlier.
242: Sollas cluster 5.
243: Balelone site stratigraphy in schematic blocks.
244: Dendrogram of the sampled sherds.
245: Dendrogram of the sampled sherds, labelled by block or context.
246: Balelone C-14 dates.
247: Balelone twosample 't' test.
248: Balelone twosample 't' test.
249: Balelone cluster 1.
250: Balelone cluster 2.
251: Balelone cluster 3.
252: Dun Carloway cell stratigraphy.
253: Dun Carloway pottery. Scale 1:2 (after Close-Brooks 1979).
254: Dun Carloway pottery. Scale 1:2 (after Close-Brooks 1979).
255: Dendrogram of sampled sherds.
256: Dendrogram of sampled sherds, labelled by layer.
257: Dun Carloway C-14 date.
258: Dun Carloway twosample 't' test.
259: Dun Carloway cluster 1.
260: Dun Carloway cluster 2.
261: Dun Carloway outlier.
262: Dun Iardhard site plan (after Macleod 1915).
263: Dun Iardhard pottery. Scale not given (after Macleod 1915).
264. Dun Iardhard pottery. Scale not given (after Macleod 1915).
265. Dendrogram of sampled sherds.
266: Dun Iardhard twosample 't' test.
267: Dun Iardhard twosample 't' test.
268: Dun Iardhard cluster 1.
269: Dun Iardhard cluster 2.
270: Dun Iardhard outlier.
271: Dun Iardhard cluster 3.
272: Dun Beag site plan (after Callander 1921).
273: Dendrogram of the sampled sherds.
274: Dun Beag twosample 't' test.
275: Dun Beag twosample 't' test.
276: Dun Beag cluster 1.
277: Dun Beag cluster 2.
278: Dun Beag cluster 3.
279: Dun Beag outlier.

Figure numbers and titles

280: Dun Ardtreck site plan phases 1 and 2 (Mackie unpublished).
281: Dun Ardtreck trenches (Mackie unpublished).
282: Dun Ardtreck site plan phase 3 (Mackie unpublished).
283: Dun Ardtreck pottery (Mackie unpublished).
284: Dun Ardtreck pottery (Mackie unpublished).
285: Dendrogram of sampled sherds.
286: Dendrogram of sampled sherds, labelled by phase and context.
287: Dun Ardtreck C-14 date.
288: Dun Ardtreck twosample 't' test.
289: Dun Ardtreck twosample 't' test.
290: Dun Ardtreck twosample 't' test.
291: Dun Ardtreck twosample 't' test.
292: Dun Ardtreck twosample 't' test.
293: Dun Ardtreck twosample 't' test.
294: Dun Ardtreck cluster 1.
295: Dun Ardtreck cluster 2.
296: Dun Ardtreck cluster 3.
297: Dun Ardtreck cluster 4.
298: Dun Ardtreck cluster 5.
299: Dun Ardtreck cluster 6.
300: Dun Ardtreck outlier.
301: Dun Ardtreck cluster 7.
302: Dun Ardtreck cluster 8.
303: Dun Ardtreck outliers.
304: Dendrogram of NAA samples from reference clays and from Hebridean sites, but excluding those for which full numerical data was not recovered.
305: Fig. 14 reproduced showing the clustering of the raw clays which were sampled by NAA.

Chapter One: The Archaeological Background.

'I ask every reader who reads this book to pardon me for daring to write so much here after so many, like a chattering bird or an incompetent judge.' (Nennius 9th century.)

The archaeology of the later prehistoric period in Western and Northern Scotland has long been dominated by three research directives- chronology, structural typology and cultural origins. They are to be found underlying most publications, usually explicitly, and have been concentrated largely on the stone structures variously described as brochs, duns, wheel/round-houses and forts. Only a few attempts have been made to integrate the entire corpus of archaeological material into reconstructions of prehistoric social processes and of those few, none have been successful in convincing the rest of the discipline as to the validity of their hypotheses. The problem appears to lie in the traditional intuitive approach to typologies and implications drawn therefrom. As Clarke (1971) has demonstrated, many of the small finds which have been used to infer chronology and cultural context are not capable of supporting such refinements of interpretation, especially when the conceptual models used to order the data are themselves suspect. This is not to say that potentially useful regularities are not observable in the archaeological record, as Caulfield (1978) has shown in regard to quern stones. The structural remains, as the most obvious feature of prehistoric activity in the West and North, have been the subject of typological, chronological and cultural study. At

first these were blatently subjective, with implicit judgements being derived from superficial examination of the sites. While the subjectivity of the research has been more recently tempered by more accurate recording of the various sites, the explanatory models for the phenomena observed in material remains, still have tended to rely heavily on tacit assumptions of how perceived patterns within the data may be interpreted (eg. MacKie 1965).

One solution to the lack of suitable data for the support of particular hypotheses is the excavation of other sites which it is hoped will provide further information. Another equally and perhaps more valuable approach, is the analytical examination of the present data, from which better founded patterns are derived and which will provide indicators for the guiding of future useful research. This does not, of course, mean that all excavation must be postponed until post excavational analysis of the existing material is completed, simply that a sensible balance must be struck. The benefit of accumulating data in fieldwork or excavation which cannot be tied into any conceptual framework, but which merely exists as an entity on its own is surely of doubtful validity. How, for example, can one begin to assess the relative social or economic context of many of the structural types unless one has some means of demonstrating contemporaneity or otherwise in the given area of study? The exercise is seen to have intrinsic worth because it involves the acquisition of new data, but the

value of that data may be limited if it cannot be demonstrated to have any direct relationship to the testing of existing theory or to the erection of new explanatory models.

Up until the 1970's, the primary interest in the Later Prehistoric period in the Western Isles, lay in the examination and description of its structures. The permutations of typology in the task are immediately obvious and also the associated dangers of deriving interpretations from the results of superficial surveys. During more recent years attention has swung towards analysis of the function of sites and towards a re-examination of the small finds, in which patterns of chronology, cultural origins and diffusion have been perceived. In particular, during the initial part of the work of this research programme, the pottery seemed as if it might contain potential, as it was ubiquitous in the archaeological record and had previously been used as an indicator of differentiation in function, spatial distribution of trade/exchange links and had been heavily relied on for chronological definition.

<u>The sites from which pottery was examined. (Fig. 1)</u>

The abundance of Later Prehistoric pottery in the archaeological record had been demonstrated by the work of Erskine Beveridge first in Tiree and Coll (1903) and then in North Uist (1911). During the course of his surveys of the

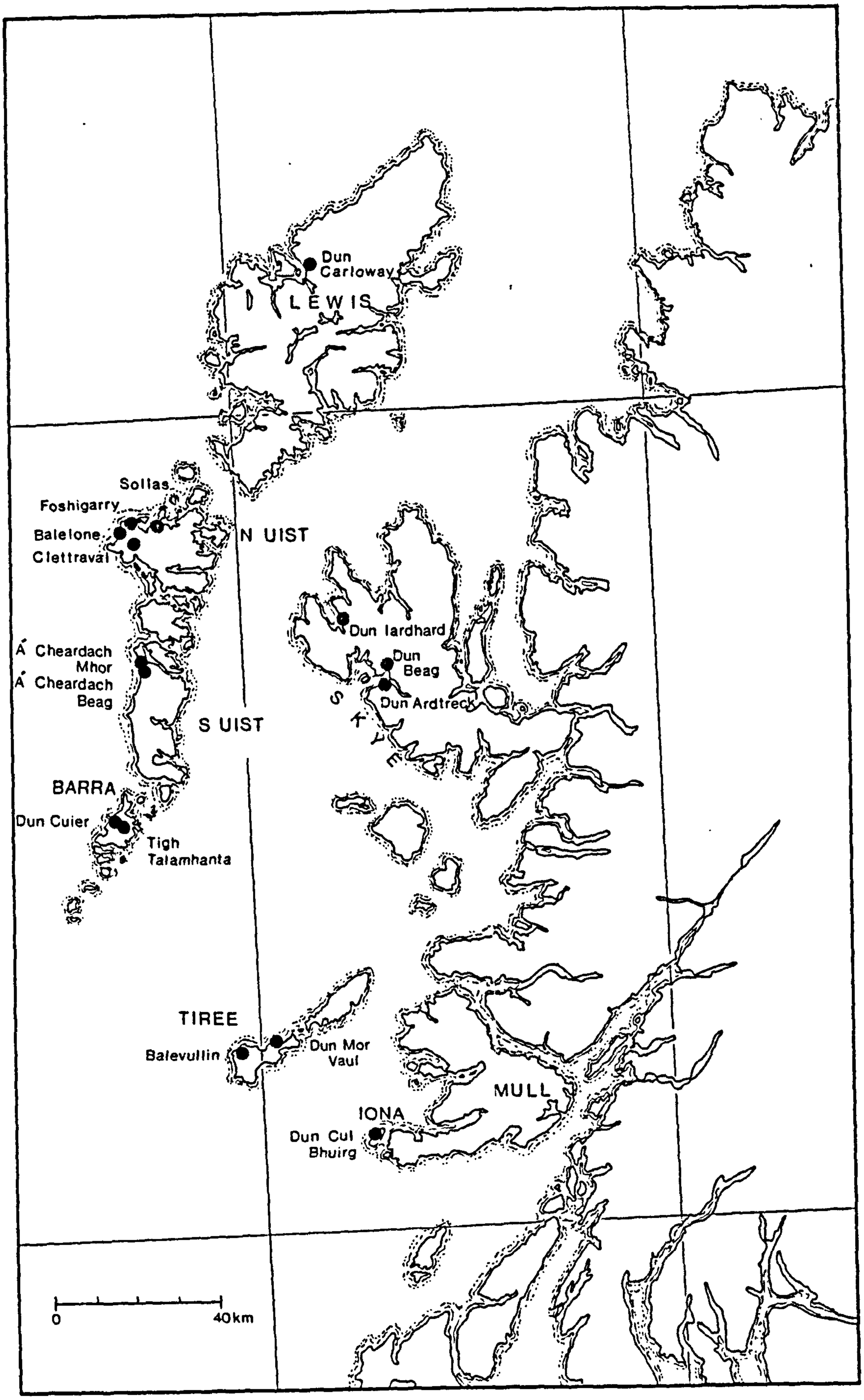


Fig. 1: Map of the Western Isles of Scotland showing the sites from which pottery was analysed.

historical and ecclesiastical monuments of the former islands, he noted the existence of sherds which were derived from the ruins of many of the defended structures and which were in part illustrated by him. His later work on North Uist demonstrated similarities in pottery decoration between the Hebridean islands, although the recovery of such material was recorded more as an interesting adjunct to the structures than for any intrinsic worth. Partly for this reason the majority of his collections which were presented to the National Museum of Antiquities of Scotland (NMAS) contained only a limited number of sherds with perfunctory details of derivation, and hence were not thought to merit extensive examination with regard to typological definition.

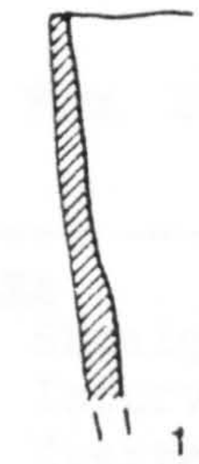
One of the first excavations which Beveridge conducted and from which a substantial, although by no means complete, collection of pottery survives, was undertaken by him at Foshigarry on North Uist. The site consisted of a complex of buildings, circular and subcircular, which was being eroded at a seacliff face near Griminish. He recognized that the structures were of varying dates but unfortunately no satisfactory context notes survive to indicate the position of finding of the sherds, several of which are unique to the Western Isles. The site report was not published until after his death, which may account for the lack of detail (Callander 1931).

Also undertaken in the early twentieth century were the

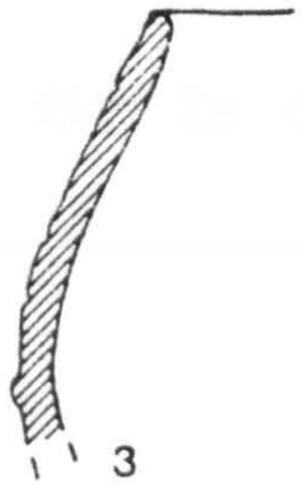
excavations carried out on Skye by the Countess Vincent Baillet de Latour at Dun Iardhard, near Dunvegan. The broch was unusual in having a secondary entrance and produced a range of pottery including sherds with applied bosses, incised lattice and feather pattern and parts of other vessels which had applied wavy cordons. The nature of these decorative types and a selection of the nature of the ornamentation found on other sherds from different sites are shown in fig. 2. The Countess continued her investigations with the excavation of another broch on Skye, Dun Beag near Struan. This site contained evidence of several periods of occupation stretching into the medieval period and from it were excavated sherds with everted rims, applied cordons and others with fingertip channelling. The excavation of further sites on other islands has demonstrated these pottery types to be typical of the Hebrides and not just confined to broch-like structures.

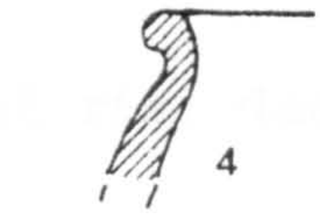
One of the more influential excavations was carried out between 1946 and 1948 by Sir Lindsay Scott (1948) at the aisled round-house of Clettraval on North Uist. This was the first of the Western Isles excavations in which any systematic attempt was made to record contexts and stratigraphy, with all the levels being related to a fixed datum point. In part for this reason and also because of the number and range of sherds recovered, which were examined in a 'statistical analysis', the site was to provide the pottery sequence which most subsequent excavators were to

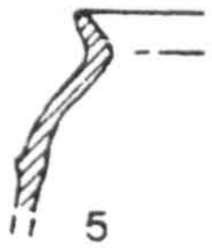
RIMS


1

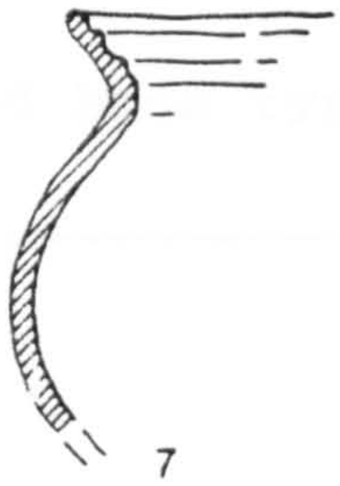

2


3

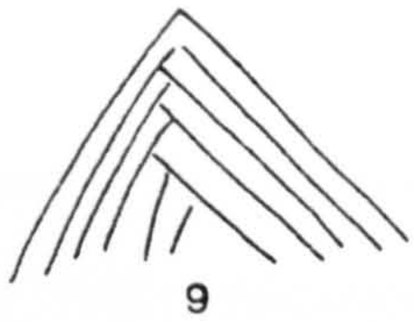

4

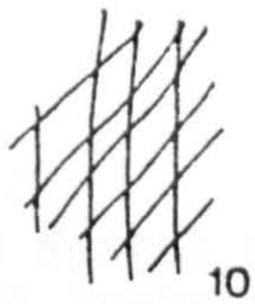

5


6


7


8


9


10


11

12

DECORATION

INCISED


13


14


15


16


17

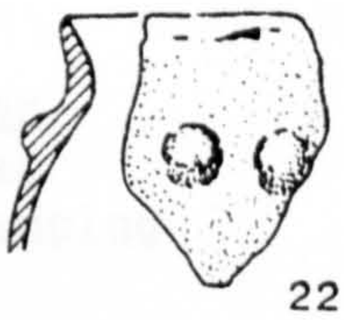

18

APPLIED


19

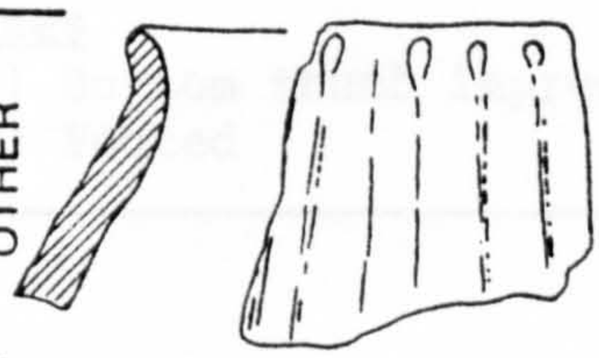

20


21


22

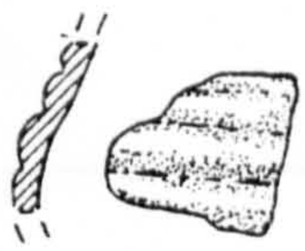

23

OTHER

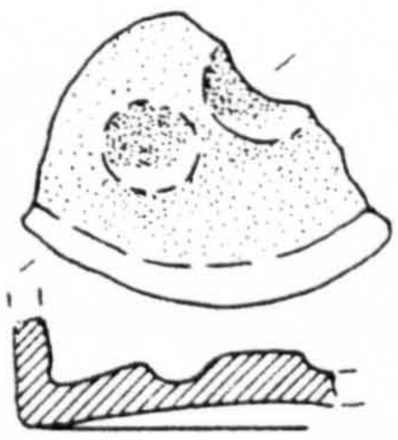

24


25


26


27

BASES


28


29


30

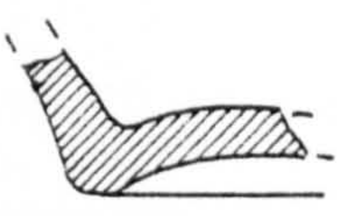

31

Fig. 2a: Terminology and features of the main stylistic and decorative types described in the text.

Fig. 2b: Key for fig. 2a of rim, decorative and base types

Rims

1) Straight
2) Upright
3) Incurving
4) Rolled
5) Everted
6) Flaring
7) Fluted

Decoration: incised

8) Chevron
9) Nested chevron
10) Lattice
11) Eyebrow
12) Line
13) Herringbone
14) Line and dot
15) Ladder
16) Feather/fir tree
17) Leaf
18) Slanting nicks

Decoration: applied

19) Wavy/zigzag cordon
20) Fingertip impressed cordon
21) Thumbnail impressed cordon
22) Applied boss
23) Cordon in chain pattern

Decoration: other

24) Stab and drag
25) Channelled arches
26) Ring pin stamping
27) Rilled

Bases

28) Bottom thumb impressed
29) Flat
30) Footed
31) Omphalos

accept as valid for all Hebridean sites. It is especially unfortunate, therefore, that the method by which the sequence was derived was itself suspect and this is examined in greater detail in chapter seven.

Before his death Scott had also commenced work at the comparable site of Tigh Talamhanta, Allasdale, Barra and which was subsequently completed by Mrs Alison Young. In the site excavation report it is clear that she was in possession of some of the notes which Scott compiled during the initial investigations, but it can also be noted that in part her description of the phases on the site was dependent upon the pottery sequence which had been outlined for Clettraval. Further excavations were conducted by her at the nearby site of Dun Cuier, Barra, and produced evidence for occupation and associated pottery types stretching into the Early Historic Period of the 7th century AD. There are, however, a number of discrepancies between the text and small finds catalogue for the site and while some of the material is clearly of this later date, the earlier parts of the site's usage are less well delineated.

A major impetus was given to archaeological study in the Hebrides by the injection of government money prior to the construction of the rocket testing ranges on South Uist. Excavation of a large, but unknown number of sites, especially wheelhouses on the machair, was conducted during the 1950's by several excavators, including Mrs. Young and

Dr. Horace Fairhurst. Two major sites have been published, that of A Cheardach Mhor (Young and Richardson 1960) and A Cheardach Bheag (Fairhurst 1971), both Drimore. The two sites proved to be multi-period wheelhouses with evidence for occupation stretching over several centuries. Mrs Young related the A Cheardach Mhor pottery sequence to that of Clettraval, Dr Fairhurst was unable to do likewise and found difficulty in ascribing a date to his site, other than that it was probably not one of the earliest of the type.

In North Uist during the same period, the site of Sollas, another wheelhouse, was excavated by Professor Richard Atkinson and although the site has not been published the report is in the process of preparation. The excavations were notable for recovering information on a very large number of pits which had been sunk into the house floor. The pits contained a variety of fills including mundane domestic rubbish and elaborate animal burials and cremations. Large numbers of sherds were recovered from floors which in some cells totalled six or more in number. The presence of the pits makes the site unique in the Western Isles, although evidence of animal based ritual was also recovered at A Cheardach Bheag, South Uist in the form of a kerb of reindeer jawbones surrounding the wheelhouse hearth.

Another site excavated in the 1950's although not published until 1981, was that of Dun Cul Bhuirg, Iona. It

is the furthest south of Hebridean islands to produce the range of typical everted rimmed, finger channelled and cordoned vessels now commonly referred to as 'Clettraval ware'. The site of Dun Cul Bhuirg consisted of a small defended fort with contemporary, or near contemporary round huts and although much of the pottery was once thought lost, it has produced a wide ranging variety of vessel types (Ritchie and Lane 1981). During the 1960's Dr Euan MacKie commenced research into the Atlantic Province in the Later Prehistoric Period and in particular sought to define the chronological pattern and geographical origins of brochs and their precursors. He re-examined a collection of sherds thought to have been found by Mr Henderson Bishop on a hut site at Balevullin, Tiree in the early 20th century and MacKie believed that these were of Late Bronze/Early Iron Age date and that they were derived from styles more common in the East and also the South West of Britain

MacKie's research in addition involved excavation, most notably at Dun Mor Vaul, Tiree, but also at Dun Ardtreck on Skye. Dun Mor Vaul gave a long sequence of settlement, perhaps from the mid first millennium BC until the Norse occupation in the islands and included a substantial body of material of Roman origin or influence. A large number of sherds were recovered, including some from a type of large plain urn otherwise not recorded from other sites and now known as 'Vaul ware'. The range of C^{14} dates which he obtained were taken to demonstrate several

distinct phases on the site and although these now require to be recalibrated they are still important for being the only available sequence for a site of this type in the Hebrides. Further work by MacKie included the excavation of Dun Ardtreck on Skye which he believed to be a broch precursor belonging to a site type labelled by him as 'semi-brochs' on the basis of a model originally suggested by Erskine Beveridge. The finds from Dun Ardtreck also included a variety of pottery types including several Roman and a number of Early Historic vessel types.

A more recent and in some ways enigmatic excavation was conducted by Mr Christopher Tabraham at Dun Carloway broch, Isle of Lewis. The work was confined to one of the chambers of the broch wall and was conducted in advance of consolidation of the structure. A deposit of ash and pottery sherds was removed, and these in conjunction with voids which were noted in the broch wall, led him to interpret the function of the chamber as being that of a pottery kiln. The pottery was examined by Dr Joanna Close-Brooks and dated on the basis of Hebridean parallels to the 5th-7th centuries AD. The voids occur in the broch wall at a very low level and if they functioned as flues for a kiln, must have been part of the original broch structure, which unless the chamber was used, cleaned out and then reused as a kiln, implies a date perhaps somewhat later for the construction of the broch than might be generally anticipated. An alternative is of course, that the parallels and date range

for the pottery are not as secure as currently believed.

The last site from which pottery was analytically examined was Balelone, North Uist. This was excavated by the Scottish Development Department, Ancient Monuments Branch during the summer of 1982 and is currently in the process of preparation for publication. The site was being eroded by the sea and although few structural remains were preserved seems to have been part of a wheelhouse complex. Pottery was recovered from several hundred small and well defined contexts with the site possessing the best recorded stratigraphy of any yet excavated in the Western Isles.

At the outset of the research programme it had been hoped that it would be possible to examine the material from the Udal, North Uist, a multi-period site undergoing excavation by Dr. Iain Crawford. However, owing to a combination of Dr. Crawford's personal circumstances, leading to the unavailability of the material, this was not possible and is much regretted.

<u>The range of Hebridean vessel forms and decorative types.</u>

The pottery types which occur during the Later Prehistoric period in the Western Isles are in form and decoration distinct from those of the Scottish mainland only some few miles to the east. Mrs. Young traced what she saw

as the development of certain of the decorative types from the neolithic pottery of the islands and this in coincidence with the supposed sequence from Clettraval led her to ascribe incised decoration to the earlier Iron Age. The forms included incised dot, chevron, lattice, herringbone and the application of small clay bosses or rondels to the vessel exteriors (Young 1966, 48). These and other motifs which occur on Hebridean pottery are shown in a somewhat schematic form in fig. 2A. Mrs. Young defined two of the purely Iron Age developments in decoration as being the stamping of vessel exteriors with bronze ring pins and secondly the application to other vessels of curved finger channelled grooves, often in double or triple format. Later developments still were the appearance of vessels with sharply everted rims and which often displayed an applied wavy cordon at the point of maximum girth. In some cases these vessels also bore double or triple arched grooved lines above the cordon; a type which occurred in some numbers at Clettraval. She believed the end point in the Hebridean sequence was delineated by the occurrence of plain vessels with no decoration and weak upright or flaring rims- a type which continued until the arrival of Norse influences on the islands.

The distinction between the incised and the everted rim pottery was also drawn by Dr. Euan MacKie who dated the occurrence of the vessel forms to the period 600 BC to AD 400 (MacKie 1971, 843). On the basis of his excavations at

Dun Mor Vaul and on other field work conducted by him, Dr. MacKie recognized the presence of six main vessel types with differing cultural origins. His models accounting for the occurrence of the styles were strongly diffusionist although he identified the earliest elements in the sequence as being represented by the small cordoned vases from Balevullin, Tiree, which were derived from the late neolithic pottery of the Western Isles. He believed that other sherds within the Balevullin assemblage bore close resemblance to Later Prehistoric pottery from eastern England but as will be argued in chapter four, the value of this observation, and of the Balevullin collection as a whole, may be limited by the uncertain association of any of the sherds with any others, or indeed with the hut site itself.

The other main pre broch type of pottery was identified by MacKie as 'Vaul' ware and was recovered in the lower levels of the pre broch hut levels at Dun Mor Vaul, Tiree. The ware was characterized by barrel shaped urns of hard smooth clay and by smaller vases bearing incised geometric patterns. Sherds of this type were, however, not just recovered in the early levels but throughout all the occupation levels of the site and were thus considered by him to have outlasted other pottery styles. The third type of pre broch pottery was identified by him as 'Abernethy' ware, on account of its occurring chiefly in forts on the mainland. Sherds of this bucket shaped, coarse gritty type were also found in the early levels of Dun Mor Vaul and more

recently have become more widely known as 'Dunagoil' ware (MacKie 1974, 157).

Amongst several varieties of everted rim pottery which Dr. MacKie distinguished as a distinctive type was 'Clickhimin' ware. This pottery type is distinguished by horizontal fluting on the internal part of the everted rim and was first noted in the early levels of the Clickhimin fort, Shetland. Pottery of a similar type was recovered from Dun Ardtreck, Skye and was considered by him to bear similarities to material from both south-west England and northern France, in particular Late Bronze Age Urnfield material. Other Urnfield elements which Dr. MacKie believed could be traced in Hebridean pottery characterized his fifth pottery grouping. In particular he drew attention to the similarities between an internally thumb impressed base from A Cheardach Mhor, South Uist to an example of a base from the Grotte de Nermont, Burgundy (MacKie 1971, 844). Another Urnfield characteristic which it was claimed could be found on Hebridean pottery, was the presence of rilling on the shoulder of the vessel and examples were noted from both Dun Ardtreck and Dun Mor Vaul.

The sixth main pottery type was another everted rim style, and one which was labelled 'Clettraval' ware on account of its occurrence at that site. The essential features have already been described, namely an everted rim and an applied wavy cordon with finger channelled arches

above. At Dun Mor Vaul MacKie identified it as first occurring in the broch construction levels and the inspiration for the channelling was accredited by him to the transference of ceramic traits from south-western Britain and of which the latter was derived from the 'eye-brow' bead rimmed bowls of that region.

Identification of intrusive influences.

One of the first archaeologists to note similarities of small artefacts classes between south-western Britain and Western Scotland was Professor Gordon Childe (1935). In terms of pottery styles these similarities were expanded upon by Sir Lindsay Scott following his excavation of Clettraval, North Uist (Scott 1948). Dr. Euan MacKie has largely been responsible for the subsequent development of this hypothesis, and not just in relation to pottery styles but also inclusive of other artefactual types. The archaeological and certainly the methodological validity of this approach has not gone without challenge (Clarke 1971), so that currently the belief in the diffusion of traits from south-western Britain to Atlantic Scotland has not won any broad acceptance and in particular the wisdom of choosing hyperselected points of similarity between the ceramic assemblages has been criticised (Alcock 1984, 17). Areas other than south-western Britain, however, have also been examined by MacKie as supplying aspects of the formal decorative and stylistic characteristics of the Hebridean

material and have already been alluded to in brief above. As a general point it is not that contacts with areas external to the Western Isles of Scotland are unlikely, rather that the provision of evidence for the argument requires more rigorous treatment than that which has traditionally been applied and that ideographic reconstructions of historical processes are not the form of justification which is required.

In the work of Sir Lindsay Scott at Clettraval, for example, it is clear that the dating of the site was reliant upon the assumption that the pottery styles were in part derived from Wessex and that their transference to the Hebrides was initiated by the movement of peoples displaced by Belgic invasions in southern Britain in the 1st century BC. This was at variance with the finding of a roman glass bead of later date in the foundation levels, and as will be argued in chapter nine, the historical model was allowed to override archaeological evidence when in reality the argument may have been a non sequitur. In another example, that of Dun Mor Vaul, Dr MacKie argued that an observed spatial differentiation in distribution of vessel type within one of the broch mural cells was explained by the occupation of that cell by an indigene at one side and an incomer at the other with both using their respectively preferred pottery types (MacKie 1974, 80). While this explanation may have been offered a little tongue in cheek, it typifies the attempted use of evidence which has been

intuitively derived for the depiction of an ideographic event. It is not that such an occurrence did not take place, but rather that the evidence is incapable of supporting that type of hypothesis.

In the report on Dun Mor Vaul, Dr. MacKie indicated that he believed that the analysis of the mineral components of the various vessel types might prove instructive for the definition of manufacturing and trading patterns (MacKie 1974, 160). Dr. David Peacock (1969; 1970) demonstrated that in Southern Britain Iron Age pottery was being traded over distances of 150 miles and that centralized production was involved. Conceptually this had not been anticipated and indicated that the models of society which were then currently employed were in need of revision and that differences in styles perhaps represented marketing areas of potters and not differences of population. A further complexity was the possibility that movements of decorative types were also in part a function of the movement of potters (Collis 1984, 171) and not just of finished products or raw materials. Given the nature of the hypotheses which were being utilised in the explanation of patterns perceived within Hebridean Later Prehistoric pottery, it was believed that some form of fabric analysis might also prove a very powerful explanatory tool for the archaeology of Atlantic Scotland. One technique which did seem potentially useful was neutron activation analysis (NAA), which had advantages in statistical accuracy and speed of operation over others

which were considered. Accordingly initial study was undertaken to examine the geological composition of the Hebrides to establish if differentiation between sources of raw material would be possible.

Geological framework of the Hebrides.

The geology of the Hebrides is complex and although it has been the subject of study since the early 19th century (Macculloch 1819), it was not until the more rigourous surveys conducted by Jehu and Craig in the 1920's that more reliable information became available. The Geological Survey instituted a project in 1970 to revise and complete the mapping of the area and the publication of the map and survey results are under preparation (Smith and Fettes 1979, 75). The Hebridean archipelago was formed by three main processes; the erosion of the westerly and north-westerly valleys of mainland Scotland, a period of block subsidence and lastly a relative rising of the sea level to the land (Phemister 1948, 3).

The Outer Islands, apart from a small area around Stornoway, are composed of a ridge of Lewisian Gneiss of Pre-Cambrian antiquity, which is divided by a deep channel from the Inner Hebrides and the mainland. The gneisses are metamorphic rocks and are found widely throughout the archipelago including the Inner Isles of Tiree and Iona. The complex of rocks include metamorphoses sediments, for

example paraschists and paragneisses, but the bulk is comprised of orthogneisses which are produced by metamorphic action on plutonic igneous rocks. The relative ages of the sedimentary and igneous components are not well established, although on Tiree there is some evidence that the sediments are older (Ibid, 7), in any case most of the rocks were probably present 2800 million years ago (Smith and Fettes 1979, 75). The Isle of Skye, which originally formed part of the mainland, differs from the rest of the islands from which pottery was examined, in that it lacks the effects of Lewisian Gneisses. It more clearly illustrates volcanic and plutonic rocks of Tertiary age, with a large basalt plateau, granitic rocks forming the Red Hills and with an eruptive mass of gabbro forming the high peaks of the Cuillins (Peach and Horne 1930, 8-9). In the south east of Skye, as around Stornoway on Lewis, are deposits of Torridonian sediments which have not been affected by metamorphism.

Elements of the more recent geological framework perhaps hold a greater significance for the Prehistoric and Historic settlement on the islands. In particular the surface landscape has been affected by both the processes of glaciation and of sand dune deposition, locally known as machair. It has long been believed that the Outer and the Inner Hebrides were overrun by the Scottish mainland icecap, during the last glacial maximum (Devensian) and that glacial tills and erratics were deposited by that process. The direction of the ice flow was established by the deposition

of the erratics and by the striae left by the moving ice mass, with deflection occurring over the high ground in Mull, Rhum and Skye (Binns et al. 1974, 3). More recent work, however, has challenged this interpretation and it has been suggested that parts of the Outer Islands in fact possessed their own independent icecaps (Flinn 1978). This new model has not been universally accepted, with alternative explanations for the striae upholding the earlier view of glaciation from the mainland (Sissons 1980). Although the debate is still unresolved the existence of an independent icecap is still a strong possibility (von Weymarn 1979; Flinn 1980). In any event, some of the glacial tills (Bibby et al. 1982, fig. 6), have provided the source for potting clays in the modern period, with that deposited at Balephuil, Tiree being of particularly established value.

In the period subsequent to glaciation the three dominant forces have been of isostatic change (Binns et al. 1974, 4), especially on the western seaboards of the Uists (Ritchie 1966, 81) and the processes of weathering and of deposition of sand. The development of the machair deposits is thought to have commenced before 5700 BP, with periods of stability and sand blow leading to the creation of the distinctive low dune belts. The relationship of human settlement to machair physiography and development has been examined in some detail, with the conclusion being drawn that the periods of occupation of archaeologically

established sites follow a sequence of geological stability with abandonment following erosion and sand blow (Ritchie 1979, 117). Soil formation is thought to have been largely dependent upon the preceding glacial processes, although subsequent weathering and climatic effects of waterlogging have altered the original structure (Glentworth 1979).

At the outset of the research programme on Later Prehistoric pottery it was appreciated that the general geological similarity of the islands and the relative closeness in geographical distance might make the geological distinction between pottery populations drawn from different islands a difficult process. This was especially the case given that the majority of published work involving analytical methods of pottery examination, had in the past largely been addressed towards the definition of patterns between geologically distinct regions in the Mediterranean and Continental Europe. In addition such work had been undertaken on sherds which were thought to have been centrally manufactured in defined production centres. In contrast the Later Prehistoric pottery from the Hebrides appeared to possess a range of more heterogeneous fabrics and on the basis of the scarcity of identified pottery kilns, was suspected to be site specific production. Nevertheless some form of petrological examination did seem to offer archaeological potential as the Hebridean pottery assemblages did display general similarities of form and decoration, which within Scotland were virtually exclusive

to the Western Isles, although parallels with several Southern British traits had been drawn (eg. Scott 1948, MacKie 1965). This potential was tested on a number of trial sherds and eventually on a test data set, with the differentiation between Hebridean clay beds proving to be a real possibility.

Thus the research programme was undertaken to examine two different but intimately connected aspects of the Hebridean later prehistoric ceramic tradition. Firstly, was the pottery capable of supporting the chronological and cultural models which were currently being derived from it, and secondly were there potentially useful patterns within the clay fabric of the various forms and decorative styles, which had not been previously recognized, and which might provide an alternative and perhaps more useful approach to the definition of later prehistoric social processes in the Hebrides? The answers to these questions were sought by a twin approach of archaeological typology and chemical analysis.

Chapter Two: Analytical and Statistical Techniques.

'To be ignorant is painful; but it is dangerous to quiet our uneasiness by the delusive opiate of hasty persuasion' (Johnson 1817, 183).

Introduction

The neutron activation analysis part of the study was originally undertaken to examine a large number of pot sherds, provisionally five hundred, and other related clay derived artefacts. The material which was sampled was drawn from the wide variety of Later Prehistoric Hebridean settlement types- hut sites, duns, brochs, other of the related small fort type and the variously described aisled, round and wheel houses. The sampling strategy was threefold; the major concern was to analyze the full range of Iron Age decorative and stylistic types, with a smaller study of clay moulds and metal working crucibles. It was hoped that this might provide information on the nature of later prehistoric metal working. The final part of the research involved the sampling and analysis of clay taken from natural modern clay beds close to known prehistoric sites. This was in an attempt to correlate artefacts from archaeological sites and their natural clay environments, though it should be stated that the difficulties of such a task were appreciated from the outset (Perlman and Asaro 1969, 35-36; Wilson 1978, 220). In addition it was intended that the information acquired would act as a test data set for the statistical procedures that were to be applied to the numerical data.

Excavated pottery is often examined microscopically to determine the minerals which either occur naturally in the raw clay, or which have been added during the production process as temper to prevent shrinkage and cracking as the vessel dries. In some instances a thin section is obtained and examined under polarising light as an aid to the more accurate identification of the mineral constituents within the clay matrix. The underlying belief behind such an examination is that naturally occurring clays will retain a chemical 'fingerprint' which is to some degree identifiable and specific to the clay bed utilised by the prehistoric population, and that it will be possible to distinguish groupings in the sherds examined which reflect the geological area of manufacture, or the process of clay preparation and firing. Such an examination is necessarily subjective and qualitative, and whilst the mineral identification may be correct, the statistical inaccuracies inherent in the process mean that the taxonomical value to the archaeologist is limited. In an examination of four sherds from Dun Cul Bhuirg, Iona, for example, Collins identified that grits used in the clay matrix were of granitic and hornblende gneiss (Collins 1981, 224) and while both of these occurred naturally on the island it was not possible to make a definitive statement on relationships or groupings, by simple virtue of the judgements being qualitative rather than quantitative. This problem may be overcome by wet chemical analysis of the elemental constituents, but,although this technique may be accurate it is very time consuming to employ for anything more than a small

number of samples. Neutron activation analysis (NAA), however, is a technique which allows simultaneous multiple element analysis of small samples and appeared the most appropriate of the practically available analytical methods for obtaining quantitative data on the chemical composition of a large number of samples drawn from the extensive population of excavated Western Isles pottery. The subsequent work on NAA was all carried out at the Scottish Universities Research and Reactor Centre at East Kilbride (SURRC).

Petrology and archaeology.

The application of petrological methods in archaeology is well established (Shotton and Hendry 1979), while more specifically, neutron activation analysis has proved one of the more useful techniques in studies of elemental composition of ceramics and other artefacts and good reviews of the subject exist (Harbottle 1976; Wilson 1978). The application of neutron activation analysis to pottery was pioneered in the United States in the Chemistry Department of the Brookhaven National Laboratory during the 1950's, with initial work concentrating on pottery from the Mediterranean region. Due to the fact that only poor resolution NaI(Tl) detectors were available at that time, the number of elements that could be analysed was limited; it was not until the later development of lithium drifted germanium (Ge(Li)) detectors with better gamma ray resolution in combination with multichannel analysers and low cost computers that it became practical to perform

multi-element analysis on large numbers of samples.

When a sample of pottery is irradiated with thermal neutrons many radioactive species are formed, giving a complex gamma ray emission spectrum from the sample. The comparison of this spectrum against the spectrum of a standard reference material of similar composition allows the absolute concentrations of those elements with appropriate gamma emissions to be calculated. For early workers in the field the preparation of the standard was of great importance, since it was upon this that the quality of the results depended (Perlman and Asaro 1969, 24-29). Now that the technique has become well established, and not just in the field of archaeology, standards which have already been well characterized can be used, thereby saving considerable initial experimentation. Previous archaeological applications of NAA have been largely addressed to the definition of groupings within Near Eastern and Mediterranean ceramics, indeed Roman material has been of major interest owing to the widespread nature of its distribution with the associated implications for trading patterns (eg. Krywonos et al. 1980) In most instances the aim of the analysis is not to establish where any of the wares sampled were manufactured, but rather to demonstrate the probability that they did or did not come from the same source, though that source may itself be unknown. In some cases the results indicate that the utilisation of local raw materials continued regardless of changes in the political and hence possible economic affiliation, as in the case of fine grey

Iron Age and Roman pottery from Portugal (Cabral et al. 1983).

Sampling Procedure.

In much of the analysis which has been undertaken on Near Eastern or Mediterranean fine wares, samples of 0.1g weight have been used. The Later Prehistoric pottery from the Hebrides, however, has in general a less homogeneous clay matrix, therefore in the present study the largest practical sample was taken to obtain a better representation of the actual chemical composition of the pottery vessel. As far as possible the drilling of selected pieces of pottery was confined to the section of the sherds, as this minimised the damage caused by the removal of the sample. The presence of temper was recognized as a factor that could bias the analysis, so that two sherds from the same clay bed might appear to be different if one have them had temper included in the drilled sample. In order to examine the effect of grits used as temper, a series of drillings was taken from the same vessel without attempting to avoid inclusions which were encountered by the diamond burr. The results for several samples taken from one vessel from Oakbank crannog, Loch Tay (provided by Dr. T.N. Dixon), are shown in Fig. 3. Sherds from this underwater site also allowed the examination of the effects of leaching and other chemical processes on the composition of pottery deposited in wet or waterloggged conditions.

Elemental Values for Ten Drillings Taken From One Pottery Vessel from Oakbank Crannog.

NA	K	LA	SM	SC	CR	FE	CO	RB	SB	CS	CE	EU	TB	LU	HF	TA	TH
9008	36700	57.14	9.558	23.88	164.5	64270	41.63	166.3	0.5082	5.546	96.90	1.831	2.501	0.4750	5.890	1.057	14.55
9627	37850	63.04	10.28	21.66	140.8	65240	39.69	164.4	0.5792	5.741	103.0	1.830	2.309	0.5705	4.691	1.090	15.51
9264	33320	57.18	9.284	------	------	------	------	------	------	------	------	------	------	------	------	------	------
9700	33530	65.25	10.34	20.40	153.0	58500	36.15	176.4	0.7330	6.340	112.0	1.767	2.095	0.5524	4.468	1.202	17.69
9535	31450	62.01	10.18	19.78	139.2	54580	25.90	137.3	0.4477	6.128	107.8	1.736	2.071	0.5281	3.890	1.097	15.55
9540	34880	68.02	11.43	20.04	149.0	56770	26.41	145.1	0.7371	6.894	122.5	1.915	2.543	0.5283	4.147	1.171	17.23
9773	34520	66.77	11.01	20.26	145.7	55900	25.56	164.9	0.4615	6.434	119.5	1.865	2.428	0.5382	4.164	1.000	17.81
10020	39280	67.95	11.44	21.02	153.7	62230	34.19	183.0	0.5258	7.135	121.0	1.931	2.634	0.5804	4.377	1.299	18.34
6834	51110	68.59	11.29	22.60	163.5	60270	38.41	200.0	0.6565	6.130	122.4	1.857	3.111	0.6455	4.654	1.077	18.85
8731	44940	66.99	10.55	20.19	143.5	63780	36.07	189.4	0.7599	6.518	110.3	1.888	2.338	0.5584	4.259	1.118	17.20

Sample Means

9203	37758	64.29	10.54	21.09	150.3	60171	33.78	169.6	0.6010	6.318	112.8	1.847	2.448	0.5530	4.504	1.123	16.97

Standard Deviations

914.1	6050	4.328	0.758	1.378	9.201	3931	6.255	20.14	0.1235	0.507	9.214	0.064	0.313	0.0463	0.578	0.089	1.447

Percentage Error

9.93	16.0	6.73	7.19	6.53	6.12	6.53	18.5	11.9	20.5	8.02	8.17	3.48	12.8	8.38	12.8	7.89	8.53

Fig. 3: The results of the analysis of ten samples from a single vessel from Oakbank crannog.

Preparation of the sample for irradiation.

In the preparation of the sample for irradiation, the surface of the section of the selected sherd was first abraded to a depth of several mm using an HI-DI number 6 diamond burr, manufactured by Ash Instruments (Gloucester). This removed any contamination which might have occurred in the post depositional history of the sherd. The powder which was removed was discarded and the tip of the diamond burr cleaned with tissue before the actual sample of circa 0.3g was removed from the cleaned surface. This weight was used since it is the largest practical limit for irradiation with larger samples not only representing more of a radiological hazard after the post irradiation state, but also being more prone to melting during irradiation as a result of heating due to radioactive decay. Larger sample sizes would also have disadvantages of limiting the number of samples in each batch for irradiation and of increasing the source self absorption problems during counting.

Drilling was carried out over a clean sheet of paper for each sherd to avoid cross contamination between samples. After drilling the 0.3g of powder was poured into a weighed polypropylene ampoule, re-weighed, sealed and the burr head cleaned. The tops of the ampoules were then sealed using a hot spatula to improve the strength of the containment. Samples also had a weighed piece of silver wire taped to the side of the ampoule to act as a flux monitor to standardize

the neutron flux which was received by each sample, since the flux within the reactor core varies at the % level over a distance of a few centimetres. By using flux monitors in this way the variation in the flux can be measured, and corrected for in calculation of concentrations.

Edinburgh reference clay: the standard

In addition to the pottery samples at least two reference clays were added to each batch. Always included was a circa 0.3g sample of Edinburgh standard reference clay, which was originally prepared and used by Dr. T. Davidson (1977). This clay is a homogeneous Staffordshire pottery clay, the chemical composition of which has been analysed by several laboratories, namely by workers at the Brookhaven National Laboratory, by Perlman and Asaro and by Handcock. The results of these analyses are shown in Fig. 4 and were kindly provided by Dr. J. Tate. The Edinburgh reference clay was used as a primary standard for calculation of the concentrations of elements in the samples. Since the treatment of results in the work involved comparisons of relative amounts of elements in the samples, the effect of homogeneity of the standard on the precision of the measurements was considered to be of more importance than the absolute accuracy of the standard. An arithmetic error in the calculation of the mean concentration for terbium was made and a value of 1.14 ppm was used instead of 1.17 ppm. This error of 0.03 ppm was within the standard deviation of 0.08 for two given laboratory

Values from which the mean for the Edinburgh standard reference clay were derived

ISOTOPE	BROOKHAVEN	PERLMAN AND ASARO	HANDCOCK	PPM OR % MEAN
Na	------	0.059%	0.05%	0.055%
K	0.793%	0.823%	0.835%	0.817%
La	43.4	37.7	37.4	39.5
Sm	8.69	6.81	6.81	7.436
Sc	26.2	25.8	22.8	24.93
Cr	108	119	114	113.6
Fe	5.10%	5.02%	4.60%	4.906%
Co	17.9	18.8	16.3	17.66
Rb	64.6	75.1	80.2	73.3
Sb	0.710	0.769	0.77	0.749
Cs	7.22	7.99	7.84	7.68
Ce	77.9	77.5	78.7	78.03
Eu	1.96	1.78	1.73	1.82
Tb	1.11	1.23	-----	1.17(*)
Lu	0.636	0.491	0.49	0.539
Hf	5.52	6.55	7.28	6.45
Ta	1.59	1.10	-----	1.345
Th	14.5	14.9	11.8	13.73

(*) Owing to a mistake in calculation, the value of 1.14 parts per million was used as the Tb content of the Edinburgh Standard Reference clay in the calculation of all other sample Tb values.

Fig. 4.

results and was used consistently throughout this work. Since the results were not compared with those obtained by others it is considered that this small error is not crucially detrimental to the value of the results obtained.

IAEA reference clay: accuracy

The IAEA originally undertook the preparation of a clay reference material to provide laboratories with the means of evaluating the accuracy of their analytical procedures. The clay was prepared from a lake sediment taken from Sardis Reservoir, Mississippi and analysed at 48 laboratories throughout the world by a variety of methods including neutron activation, atomic absorption, X-ray fluorescence and mass spectrometry. The results for the various elements obtained by the laboratories were collated by the IAEA and following rejection of outliers three categories of results were produced; values which could be 'recommended' with a relatively high degree of confidence, values which could be 'recommended' with a reasonable degree of confidence and results which were provided for information only. As a test of accuracy samples of IAEA clay were analysed along with the batches of Hebridean pottery. The results for the 7 analyses are shown in Fig. 5. The accuracy which was obtained during the period of research at SURRC is shown in Fig. 6 and it can be seen that the elements Na, La, Sm, Sc, Co, Rb, Sb, Cs, Ce and Hf could have derived from the same population as the IAEA published reference means at a 95% confidence level.

Values obtained for IAEA SL-1

	SAMP. NUMB. 151	SAMP. NUMB. 310	SAMP. NUMB. 364	SAMP. NUMB. 420	SAMP. NUMB. 475	SAMP. NUMB. 525	SAMP. NUMB. 554	SAMP. MEANS	IAEA VALUES	DGR OF CON.
Na	.153%	.161%	.156%	.162%	.146%	.154%	.128%	.151%	.172% ± .012	B
K	1.11%	1.71%	1.30%	1.42%	1.39%	1.35%	1.26%	1.36%	1.5%	C
La	49.17	56.85	46.89	54.59	51.15	50.86	45.69	50.74	52.6 ± 3.1	A
Sm	8.213	9.828	9.194	9.320	8.370	9.463	7.741	8.876	9.25 ± .51	B
Sc	18.90	20.88	19.68	21.49	18.52	19.00	16.14	19.23	17.3 ± 1.1	B
Cr	131.6	160.9	127.4	155.2	138.5	130.4	119.7	137.7	104 ± 9	B
Fe	7.60%	8.38%	7.24%	8.70%	7.38%	7.56%	6.60%	7.64%	6.74% ± .17	A
Co	19.86	21.50	19.27	22.72	18.62	19.80	16.68	19.78	19.8 ± 1.5	A
Rb	124.4	149.4	137.8	137.7	113.6	148.2	107.5	131.2	113 ± 11	A
Sb	1.288	1.577	-----	1.612	1.417	-----	1.066	1.392	1.31 ± .12	B
Cs	7.021	8.699	6.754	9.142	6.151	7.692	6.494	7.422	7.01 ± .88	B
Ce	102.9	118.3	100.4	120.4	104.5	105.7	89.13	105.9	117 ± 17	A
Eu	1.921	1.979	1.945	2.259	1.928	1.963	1.712	1.958	1.6	C
Tb	1.537	1.875	1.720	2.152	1.405	1.490	1.338	1.645	1.4	C
Lu	.6070	.6335	.5663	.6285	.6125	.5864	.4748	.5870	.54	C
Hf	5.303	6.369	4.464	6.142	5.203	5.371	4.196	5.293	4.16 ± .58	B
Ta	1.244	1.728	1.340	1.525	1.328	1.284	1.199	1.378	1.6	C
Th	15.77	17.63	15.03	19.03	15.72	15.80	13.75	16.10	14 ± 1	A

Degrees of Confidence:

A= Relatively high degree. Reported uncertainties showing confidence limits of the mean for a significance level of 0.05.

B= Reasonable degree. Reported uncertainties showing confidence limits of the mean for a significance level of 0.05.

C= Non-certified concentrations of elements. Information value only.

Fig. 5.

Fig. 6: The values obtained by NAA for the IAEA clay and those provided by the IAEA as reference concentrations.

	SAMP. MEANS IAEA CLAY	STD. DEV.	IAEA REF. MEANS	STD. DEV.
Na	0.151%	0.012	0.172%	0.012
K	1.36%	0.184	1.5%	----
La	50.74	3.98	52.6	3.1
Sm	8.876	0.767	9.25	0.51
Sc	19.23	1.74	17.3	1.1
Cr	137.6	15.1	104	9
Co	19.78	1.95	19.8	1.5
Fe	7.64%	0.71	6.74%	0,17
Rb	111.6	16.5	113	11
Sb	1.392	0.22	1.31	0.12
Cs	7.422	1.14	7.01	0.8
Ce	105.9	10.7	117	17
Eu	1.958	0.16	1.6	---
Tb	1.694	0.29	1.4	---
Lu	0.5870	0.05	0.54	---
Hf	5.293	0.79	4.16	0.58
Ta	1.378	0.018	1.6	---
Th	16.10	1.73	14	1

The terbium values in this figure have been corrected to those which would have been obtained if an error had not been made in the calculation of the Edinburgh reference clay mean (Fig. 4).

SURRC reference clay: precision

As a test of precision the in house SURRC clay was used and the results for fifteen analyses undertaken throughout the course of the research programme are shown in Fig. 7. The precision with which the elements within the clay were measured is given by the percentage error for each of the columns. It can be seen that apart from Sb and Tb the precision of the analysis for all the other elements is less than 13% and indeed for Na, K, La, Sm, Sc, Cr, Fe, Co, Ce, Lu, Ta and Th the relative error is less than 10%. It must be remembered, however, that these figures are for a fairly homogeneous reference clay and while they do demonstrate the precision obtained throughout the eighteen month period of analysis, a more useful indication of the precision with which the Later Prehistoric pottery was analysed is given in Fig. 3 as previously indicated. This is for ten samples taken from one vessel recovered from Oakbank crannog and indicates that as might be expected the percentage error for some elements is higher. For others, such as La and Sm, nevertheless, it is slightly lower.

Sample Packaging, Irradiation and Counting

Following addition of the flux monitor, each sample was wrapped in a piece of aluminium foil to prevent the samples sticking together during the irradiation process. The foil also acted as a medium to use for numbering with felt-tip pen,

Fifteen Samples of SURRC Clay Showing the Precision Obtained.

NA	K	LA	SM	SC	CR	FE	CO	RB	SB	CS	CE	EU	TB	LU	HF	TA	TH
1325	18810	44.50	6.802	21.40	123.5	17160	10.43	114.7	1.016	11.03	72.83	1.536	1.402	0.4996	5.314	1.652	14.73
1398	19800	46.01	7.203	22.08	133.9	17920	10.02	110.7	0.6836	11.18	78.88	1.730	1.144	0.5588	5.901	1.619	15.48
1547	-----	42.80	6.515	22.30	131.1	17540	11.07	98.06	0.9279	11.94	80.37	1.696	1.456	0.6233	6.518	1.617	15.49
1550	21270	49.21	8.056	24.15	148.3	19650	9.759	130.2	0.8985	12.63	84.06	1.393	1.544	0.6262	7.498	1.486	16.96
1245	-----	40.83	5.585	19.35	104.9	15310	9.013	111.7	0.3471	9.861	67.42	1.434	1.264	0.4854	5.300	1.219	13.32
1283	17650	44.47	6.453	20.44	126.1	15560	9.834	128.0	0.6567	12.17	76.01	1.655	1.691	0.5422	5.731	1.374	14.11
1469	21570	49.18	7.018	22.89	139.5	17750	9.703	122.2	0.9340	12.37	76.28	1.338	1.163	0.5735	6.389	1.332	16.35
1310	22880	50.17	6.982	23.03	134.7	18990	9.755	100.9	0.9048	14.76	80.46	1.871	1.443	0.5369	5.903	1.414	15.66
1174	21300	42.78	6.632	21.69	135.0	16850	9.454	89.57	0.9354	13.48	77.88	1.736	1.124	0.5107	6.291	1.503	15.43
1260	19280	47.12	6.777	21.90	132.0	17350	9.907	105.3	0.9847	12.82	77.22	1.669	1.141	0.5540	6.530	1.587	14.83
1253	21900	48.59	6.820	21.88	125.7	18140	9.947	100.9	0.7242	12.56	78.41	1.791	0.9708	0.5163	6.586	1.427	15.22
1182	18950	42.79	6.410	20.76	125.2	16930	8.740	90.17	0.8342	12.94	75.43	1.695	1.205	0.5367	5.704	1.212	14.30
1298	21200	48.81	7.062	23.18	135.6	19430	10.66	105.3	1.094	14.42	80.99	1.905	0.7076	0.5898	6.326	1.481	15.88
1220	19180	46.08	6.645	22.94	138.8	18570	10.04	101.9	1.169	14.67	83.97	1.846	1.054	0.5504	7.113	1.501	16.25
1308	23510	50.68	7.164	23.53	141.8	19020	10.22	91.24	0.7346	14.29	82.17	1.869	0.6897	0.5790	6.879	1.500	16.16
Sample Means																	
1322	20562	46.27	6.808	22.10	131.7	17745	9.904	106.7	0.8563	12.74	78.16	1.678	1.200	0.5522	6.266	1.462	15.35
Standard Deviations																	
119.2	1747	3.125	0.528	1.268	10.09	1288	0.584	12.89	0.2035	1.425	4.340	0.179	0.283	0.0414	0.631	0.135	0.960
Percentage Error																	
9.02	8.49	6.75	7.76	5.74	7.66	7.26	5.90	12.1	23.8	11.2	5.55	10.7	23.6	7.50	10.1	9.25	6.26

Fig. 7: Precision.

thereby further decreasing the possibility of contaminating the ampoule or the sample itself. Usually the total number of samples and standards analysed in each run was twenty-seven, this being both an acceptable number to place in the reactor at any one time and the optimum number that could be handled during the post irradiation gamma counting. The samples were irradiated in the central vertical stringer of the SURRC UTR-300 research reactor for approximately six hours at a neutron flux of circa $3x10^{12}$ neutrons cm^{-2} sec^{-1}.

After a four day period to allow decay of excess short lived radioactivity, samples were counted on either a 25 cc or an 80 cc (Ge(Li)) detector for twenty minutes each. A sample holder was used to control the geometry of presentation of the sample to the detector. The height of the sample above the detector was adjusted on shelves within a shielded aluminium column until a counting dead time of 10% or less was achieved; for the short counts this was usually 20-30 cm above the detector itself. During the first count the nuclides ^{24}Na, ^{42}K, ^{140}La and ^{153}Sm were detected. A second count two weeks later was necessary to detect other elements after the decay of most of the short lived radionuclides. During the second count, which was for one hour and usually at a very low height on the shelves above the detector, the following nuclides were detected; ^{46}Sc, ^{51}Cr, ^{59}Fe, ^{60}Co, ^{86}Rb, ^{124}Sb, ^{134}Cs, ^{141}Ce, ^{152}Eu, ^{160}Tb, ^{177}Lu, ^{181}Hf, ^{182}Ta and ^{232}Th. The Th isotope ^{232}Th which was detected was derived from the following reaction:

$$^{232}_{Th} + n \rightarrow {}^{233}Th \xrightarrow{\beta^-} {}^{233}Pa.$$

For each of the elements Fe, Co, Eu, Tb, Lu and Hf two separate photopeaks were detected, as shown in Fig. 8, and in each case the peak with the highest intensity and the lowest counting error was used for analysis. Spectra were recorded using an EG&G Ortec 7032 analyser incorporating a 4096 channel analyser and LSI-11 computer and were analysed using the standard Ortec peak search and analysis programme GAMMA-2. Concentrations were derived from the GAMMA-2 output using the SURRC programme NAA, written by Mr. I. Harris. In optimum cases eighteen elements were determined but in some samples it was not possible to obtain concentrations for all of the elements due to decay of the radionuclide to a level at which it was not detected, notably in the case of potassium. In other cases concentrations were not obtained as the GAMMA-2 programme contains an arbitrary 30% cut off for the uncertainty associated with a given peak and if this is exceeded the peak is rejected. Fortunately the elements for which concentrations were not obtained were mostly those which were not used in the calculation of the pottery groups.

Selection of Elements

An important aspect of this study was the selection of which elements are suitable for use in the calculation of the pottery groups by the clustering analysis. The three major factors which had to be considered were the chemical stability

of each element within the matrix of the pottery, the statistical variations inherent in the analysis and the problem of contamination from the diamond burr. Since the object of the study was to attempt to detect variations indicative of differences in the raw materials utilised (or in the methods of production in the pottery manufacturing process), it was imperative that elements selected as attributes for input to clustering should reflect the composition of the clay at the time of production and should not have been affected by post depositional factors. Initially rejected on these grounds were Na, K, Fe, and Co as these were known to be open to the process of leaching and enrichment. In the case of Na, for example, it was known that the lower levels of the wheelhouse at A Cheardach Mhor, Drimore, S. Uist were waterlogged (Young and Richardson 1960, 137). In such a salt rich depositional environment it would be possible for Na enrichment to occur. Subsequent analysis using that element as a discriminating factor might have made more of a statement about the post occupational environment of the site, than about the contemporary archaeological context of the pottery vessel. Elements were also rejected on the basis of the errors associated with their determination. Fig. 8 provides an indication of the magnitude of these errors for the elements which were detected. The total error was derived from the a priori and counting statistics errors inherent in the method. The a priori errors derive from procedures such as the weighing of the sample and from slight differences in counting geometry. Past experience at SURRC has

Elemental isotopes showing typical percentage errors.

ELEMENT	ENERGY (KEV) AND ISOTOPE	HALF LIFE	TYPICAL % TOTAL ERROR
Sodium	1368-Na-24	15 hours	3-5 %
Potassium	1525-K-42	12.4 hours	4-14 %
Lanthanum	1596-La-140	40.22 hours	3-6 %
Samarium	103-Sm-153	47 hours	3-4 %
Scandium	889-Sc-46	83.8 days	2-3 %
Chromium	320-Cr-51	27.8 days	3-5 %
Iron (1)	1099-Fe-59	45.1 days	2-3 %
Iron (2)	1292-Fe-59	45.1 days	2-3 %
Cobalt (1)	1173-Co-60	5.26 years	3-4 %
Cobalt (2)	1333-Co-60	5.26 years	3-4 %
Rubidium	1078-Rb-86	18.66 days	10-18 %
Antimony	1691-Sb-124	60.3 days	16-25 %
Caesium	796-Cs-134	2.05 years	5-19 %
Cerium	145-Ce-141	33 days	3-4 %
Europium (1)	1408-Eu-152	13 years	5-8 %
Europium (2)	344-Eu-152	13 years	4-5 %
Terbium (1)	879-Tb-160	73 days	22-32 %
Terbium (2)	216-Tb-160	73 days	14-20 %
Lutetium (1)	113-Lu-177M	155 days	4-7 %
Lutetium (2)	208-Lu-177M	155 days	13-30 %
Hafnium (1)	133-Hf-181	42.4 days	4-7 %
Hafnium (2)	482-Hf-181	42.4 days	5-9 %
Tantalum	1221-Ta-182	115 days	9-20 %
Thorium	312-Th-232	27 days	3-5 %

Fig. 8.

indicated that a value of 2% should be allocated for this factor. The counting errors were dependent upon the intensity of the gamma photopeak being detected, the concentrations of the elements in the samples and the length of time for which the sample was counted: in general the counting error contributed most to the total error for each element. The elements Rb, Sb and Ta were not used for clustering for this reason and the gamma photopeaks Tb1, Lu2 and Hf2 were not used since alternative gamma ray energies for these elements offered better detection properties. The element Cs, although it did have an error approaching 20% in its detection, was not rejected because the potential range of values over which it was sufficiently large for it still to be useful in discriminating between clays.

Contamination

A further constraint in the choice of the elements was the possibility of contamination from the drill bit used in sampling. In the majority of previous work in the field of neutron activation analysis, tungsten-carbide bits were used as the sampling tool. These have the disadvantage of contributing contamination either directly, or in the form of interference with spectral peaks. Elements affected by such forms of contamination include Co, Ta and Lu, and while it is a relatively simple matter to determine whether large scale contamination has taken place by looking for tungsten peaks in the sample spectrum (Harbottle, 1976, 39), it is now clear that

this does not necessarily involve the breaking off of a large piece of the drill bit, as was once thought. Rather it appears that the contamination may take the form of small chips snapping off from the drill tip. These are not as simple to detect by visual inspection of the bit, and the smaller tungsten peak may be unnoticed in the spectrum, with the consequence that undesirable levels of contamination may be affecting elements which might have been used as diagnostic indicators of raw clay sources (Attas et al. 1984, 104-107).

In the sampling of the Hebridean pottery, HI-DI number 6 diamond burrs were used. These burrs, manufactured by Ash Instruments (Gloucester), have a head consisting of both natural and synthetic diamond particles, attached to a stainless steel shaft by a nickel electro-deposit. If wear were to occur during the drilling of samples, the heads (being composed of carbon) would have only a diluting effect on the derived elemental composition of the pottery, and since ratios were ultimately used in the cluster analysis of the sherds in this study, this effect could be minimized. The nickel electro-deposit used in the binding of the diamond to the shaft of the burr is part of a 99.99% pure proprietary nickel plating solution obtained by Ash Instruments (Gloucester) from Cannings Ltd., Birmingham, and it is estimated by them that any trace elements would be so diluted by the plating process that they would be undetectable. This leaves only the stainless steel shaft as a possible source of contamination and this is the part of the burr from which contamination is least

likely to occur as the shaft itself is only rarely in contact with the pottery sherd during sampling. Values for the composition of the drill bit, as specified by the manufacturers are shown in Fig. 9 and values obtained for the analysis of 0.1g of a new diamond burr and part of the stainless steel shaft by NAA are shown in Fig. 10. The detection of elements additional to those in the certified composition may be explained by the definition of the term undetectable. Neutron activation, with very low limits of detection provides a greater level of analytical definition than that required for quality control in the manufacturing process.

It is evident from Figs. 9 and 10 that Cr forms one of the major components of the shaft, so to ascertain if the high levels of Cr observed in some samples, for example nos. 468, 469 and 470, were in part being derived from the diamond burr, further samples from these sherds were re-analysed without any contact with metal instruments in the sampling procedure. It can be seen from the above tables that the manufacturer's estimated level for this element in the diamond burr is in the order of 17-19% whilst the NAA value is 14.68%; this difference may be explained by the fact that the manufacturer's figure is for the shaft only, the NAA figure was derived from part of the shaft inclusive of the diamond head of the burr, so that the level of Cr would reasonably be expected to be lower. Cr was of particular interest because the analysis of samples from clay beds indicated that it was potentially a good diagnostic indicator of raw material. The

Elemental composition of HI-DI No 6 stainless steel shafts by manufacturers specifications.

ELEMENT	PERCENTAGE AMOUNT
Carbon	0.12 % maximum
Silicone	0.20 % - 1.00 %
Manganese	1.00 % - 2.00 %
Phosphorus	0.45 % maximum
Sulphur	0.15 % - 0.30 %
Chromium	17.0 % - 19.0 %
Molybdenum	0.70 %
Nickel	8.00 % - 11.00 %
Titanium	0.10 % maximum
Niobium	0.20 % maximum
Copper	0.50 % maximum

Fig. 9.

Elemental composition of HI-DI No. 6 burr and part shaft by NAA

ELEMENT	PERCENTAGE AMOUNT
Sodium	0.1415 %
Chromium	14.68 %
Iron	79.45 %
Cobalt	0.3194 %
Antimony	0.0011 %
Cerium	0.0223 %
Thorium	0.0006 %

Fig. 10.

results for the drilled and non-drilled pottery samples which were analysed are shown in Fig. 11, and these indicate that contamination from the diamond burr is a factor which requires further elimination of elements from the input to the clustering procedures and in particular Cr was rejected. The explanation for the contamination may be that as the head of the diamond burr rotated, small chips were eroded and that these included part of the embedding material from the drill shaft.

For the variety of reasons outlined above it was decided that only La, Sm, Sc, Cs, Ce, Tb2, Lu1, Hf1 and Th would be used as inputs to statistical tests for the definition of pottery groupings.

Statistical analysis and the test data set

The quantity of numerical information in this study demanded the use of computer techniques for full statistical analysis of the results. The requirements for the statistical processes which were applied to the data had one essential characteristic, namely that the classification involved would group pottery samples into a number of classes, such that samples within a group were more similar to each other in some respect than to those in other classes. The package which was used on the Edinburgh Regional Computer Centre's (ERCC) ICL 2976 mainframe computer was CLUSTAN 2.1 (Wishart 1982). This is a comprehensive package which offers the user a

The three samples from Dun Cul Bhuirg, Iona which were sampled using a No. 6 HI-DI drillbit and which were resampled without contact with metal. In each case the first row of figures is the drilled sample.

NAA Sample Numbers 469 (drilled) and 555 (undrilled) both from the same sherd (Ritchie and Lane 1981, fig. 2.34).

NA	K	LA	SM	SC	CR	FE	CO	RB	SB	CS	CE	EU	TB	LU	HF	TA	TH
10550	18280	32.86	5.676	12.98	1315	48790	23.88	38.64	0.7887	1.972	55.26	1.323	0.9171	0.3451	5.307	0.8324	7.547
12940	23460	39.40	5.219	13.91	117.9	49530	13.89	59.95	1.147	3.482	77.62	1.622	0.9805	0.3378	5.743	1.018	10.08

NAA Sample numbers 470 (drilled) and 556 (undrilled) both from the same sherd (Ritchie and Lane 1981, fig. 2.35).

NA	K	LA	SM	SC	CR	FE	CO	RB	SB	CS	CE	EU	TB	LU	HF	TA	TH
19180	21920	43.20	6.048	17.00	2029	48400	37.24	93.37	———	3.805	69.96	1.376	1.260	0.3643	6.402	0.8644	11.30
19720	23280	41.51	5.379	19.58	176.3	48100	16.98	102.7	———	4.926	82.26	1.753	0.9354	0.4115	6.328	0.8416	11.51

NAA sample Numbers 468 (drilled) and 557 (undrilled) both from the same sherd (Ritchie and Lane 1981, fig. 2.63).

NA	K	LA	SM	SC	CR	FE	CO	RB	SB	CS	CE	EU	TB	LU	HF	TA	TH
13640	21890	33.66	4.899	15.93	1125	44510	24.52	80.24	———	3.402	52.66	1.163	1.609	0.3730	6.381	1.133	9.334
14270	28430	32.18	4.914	19.05	184.1	50720	14.90	79.67	———	4.063	70.35	1.573	1.131	0.4147	7.036	1.040	12.78

Means of the 10 sherds which were sampled using the drill (NAA sample nos. 464-473).

12538	23635	41.55	6.167	16.33	761.6	46275	21.90	88.67	0.7887	3.920	66.36	1.277	1.387	0.3941	6.158	1.065	11.19

Standard Deviations of the 10 drilled samples.

4172.9	3231.7	6.379	1.281	1.689	608.27	6340.2	6.277	22.82	———	1.035	12.19	0.2183	0.4168	0.0701	0.8524	0.1993	2.026

Fig. 11

wide variety of statistical techniques with which to search for structure within binary and multivariate data sets. Within the field of NAA there is no generally agreed method of treating the raw data, yet to apply various clustering methods to pottery data until archaeologically useful results are derived is intuitively dangerous because, by its nature, the structure which really exists in the data is unknown. For this reason it was decided to obtain a test data set representative of the differences in clay beds occurring in the Hebrides in order to make definitive statements about the relative merits of given statistical techniques in recovering structure from this known data set. The test data was obtained by sampling natural clay sources from those Hebridean islands from which Later Prehistoric pottery was sampled in the major part of the research programme. An attempt was made to obtain clay from as near as possible to the known, and sampled, Later Prehistoric sites, though of course, there was only a limited possibility of being able to make any definitive statement about these being the sources from which the contemporary potters derived their raw materials. In some instances possible sources had been identified by excavators (Young 1956, 304), while in others, known 19 th century sources of pottery clays on the islands were selected on the basis that at least these were of sufficiently suitable composition to fire into vessels successfully. In one example, that of Balephuil, Tiree, the clay was of such quality that it was constructed into vessels straight from the ground without preliminary preparation of the matrix being necessary (Hugh

Cheape, NMAS, pers comm). The clays obtained from fourteen sites were subjected to X-Ray diffraction analysis by Professor Craig and Mr. Geoff Angell of the Department of Geology, University of Edinburgh. This ascertained the mineralological composition and was used to assess their relative merits as potting clays. The results for the x-ray diffraction analysis were as follows:

1) From Balephuil, Tiree grid NM 970413. Very homogeneous, light brown sticky clay taken from a road cutting. Minerals: quartz, muscovite, chlorite, kaolinite, albite, feldspar and tremolite.

2) From Balelone, N. Uist grid NF 726742. Taken from a stream bank, grey clay with many grits. Minerals: albite, tremolite, chlorite, quartz, muscovite and feldspar.

3) From Drimore, S. Uist grid NF 775407. Taken from a thin layer of brown clay deep in a quarry face. Minerals: albite, tremolite, chlorite, quartz, muscovite and montmorillonite.

4) From Sollas, N. Uist grid NF 815740. Taken from a stream bank, grey and gritty. Minerals: albite, tremolite, chlorite, quartz, muscovite and k. feldspar.

5) From Clettraval N. Uist grid NF 748716. Taken from an exposed trackside bank 100 metres north of the wheelhouse, brown clay/decaying rock. Minerals: albite, tremolite, quartz

and montmorillonite.

6) From Tigh Talamhanta, Barra grid NL 675023. Taken from a stream bank 200 metres north of wheelhouse, light brown and sticky. Minerals: albite, montmorillonite, diopside and possibly halloysite.

7) From Ben Cliad, Barra grid NL 683034. Taken from a stream bank, grey and sticky with some grits. Minerals: albite, tremolite, quartz, chlorite, kaolinite, muscovite, montmorillonite and k. feldspar.

8) From Dun Carloway, Lewis grid NB 190414. Taken from 50 metres to the north of the broch, grey and gritty. Minerals: albite, tremolite, quartz, montmorillonite, chlorite, muscovite and k. feldspar.

9) From Dun Iardhard Skye grid NG 235506, 400 metres north of broch, brown and very gritty decaying rock/clay. Minerals: albite, diopside and montmorillonite.

10) From Iona near Dun Cul Bhuirg, grid NM 276236. Taken from brown clay/humus layer at the side of roadside ditch. Minerals: quartz, albite, chlorite and muscovite.

11) From Dun Beag, Skye grid NG 338386. Taken from a stream bank 100 metres to the north of the broch, orange brown clay. Minerals: albite, montmorillonite, diopside and zeolite.

12) From Dun Ardtreck, Skye grid NG 338357. Taken from a roadside cutting, brown gritty clay/decaying rock. Minerals: zeolite, montmorillonite and possibly diopside.

13) From Foshigarry, N. Uist grid NF 742765. Taken from a rock face being eroded by the sea, grey clay. Minerals, albite, tremolite, quartz, muscovite, montmorillonite, chlorite and k. feldspar.

14) From Dun Mor Vaul, Tiree grid NM 043492. Taken from 25 metres east of the broch, black clay/humus. Minerals: quartz, albite, tremolite, chlorite, muscovite and montmorillonite.

The samples were heated at a temperature of 275 °C to remove moisture and to simulate the effects of firing upon the clays. Experimental work has indicated that this is a temperature at which usable pottery vessels can be fired (Martlew 1982, 32). In addition samples of clay from Balephuil, Tiree were taken and mixed with grass to study the effects of organic temper upon the chemical composition as it was known that organic material was often included within the fabric of Later Prehistoric pottery vessels (eg. Ritchie and Lane 1981). Further investigation of the effects of seashell as a temper was undertaken, since shell also occurs within the matrix of Later Prehistoric pottery. In this instance 5 g of clay from Balephuil was mixed with 1g of crushed barnacle and similarly heated to 275 °C After the heating process the clays were ground to a fine powder using a glass mortar and pestle

and 0.3g samples were taken in an identical manner to that used for the pottery sherds.

It is clear from the descriptions of the clays and from the X-Ray diffraction results that some of the samples were of good quality potting clays whilst others were low quality and included soil or decaying rock fragments. It should be noted that for the low quality samples the concentrations derived for some of the eight selected elements have a greater numerical spread, for example those from Dun Mor Vaul and from Iona. This would be expected to be reflected in the statistically derived dendrograms where a greater spread of values would be demonstrated as a less tight cluster. Samples for which some of the selected elements were not detected (notably lutetium in the case of Dun Iardhard, Skye and Tigh Talamhanta, Barra) were excluded from the initial clustering as the problems associated with their statistical treatment are a further issue to the one of the construction of a test data set. The concentrations for these clays and indeed for all the pottery samples, were entered into a CATALOG6 database which was also run on the ERCC 2976 mainframe computer. The benefit of this method of storing the data is that retrieval sets of any given specification from within the database, can very quickly be searched for and sent to the CLUSTAN package for evaluation. An additional advantage is that once the data are entered into the database and checked, the numbers within the retrieval sets can be guaranteed to be correct, thereby saving considerable time checking subsequent inputs to the

clustering procedures.

Cluster analysis

In CLUSCOM, CLUSTAN's conversational form, the first procedure which was adopted was the standardization of the values for each case (ie each pottery sherd). The variables are standardised to zero mean and unit variance, using the standard deviations which are derived from the complete set of cases which are to be examined in that particular clustering run. This ensures that all elements are given an equal weight in the determination of the dissimilarity matrix. If the variables pertaining to each sample are not standardised, then the similarity coefficients are biased towards those variables that have large variances. Clearly this would be a disadvantage because it may well be that unsuspected elements are in fact the best discriminants between cases, and their value in performing this function would be otherwise reduced.

The graphical results which can be obtained by hierarchical methods of interpretation are in terms of clarity, the easiest to interpret, though there are disadvantages, as discussed below. The variety of agglomerative methods which can be applied to the data mean that 'tightness' of cluster can be demonstrated when a variety of clustering methods produce a broadly similar result. Of these agglomerative clustering techniques Ward's method is believed to be the most

useful (Wishart 1982, 33) and relies on the error sum of squares method of measuring the distance from each individual to the centroid of its parent cluster. Ward's method requires that a distance coefficient be calculated for input to the transformation and this is done through the procedure CORREL contained with the CLUSTAN package. The similarity coefficient which is required by the method is the 'squared Euclidean distance' and this is the most common measure of dissimilarity between clusters. The technique is of greatest value in locating clusters which are spherical in shape, but when this is not the case, misleading results may be obtained, for example, when the 'natural' clusters are elongated.

The matrix which was derived from the clay samples elemental values provides the input for the agglomerative clustering by Ward's method which is achieved by the successive fusions of the total number of samples into groups. It is important to note, however, that once fusions are made they are irrevocable and this is the major disadvantage of the method, since a sample which is wrongly assigned early on in the clustering process, cannot later be reallocated to another group. A further problem is that because the fusion process ultimately joins all the samples into one group, it is left to the users discretion to decide upon the correct number of clusters and at what step he wishes the analysis to stop (Everitt 1981, 64). For these reasons it is advisable to supplement Ward's method with other forms of analysis such as the k means test contained within the procedure RELOCATE of

the CLUSTAN package. RELOCATE has the advantage of retesting the validity of the fit of each of the members to its initially allocated cluster during each cycle of the clustering process and if the fit is not satisfactory the sample is removed and reallocated. It was found, however, that this option was very rarely invoked by the program, perhaps owing to the relatively small number of samples. The clusters which were produced by the procedures CORREL and HIERARCHY using Ward's method were generally the most satisfactory which could be obtained.

The test data set was subjected to the various steps in the analysis outlined above and the dendrogram shown in Fig. 12 was derived The values on the 'Y' axis are those for the Ward's method coefficient at which clusters fused together. It can be seen that in many cases the clustering procedure was able to allocate the sample results to groups from the same source (for example, from Sollas, N. Uist), however, in others it was not. In the case of Balelone (B_lone), N. Uist it can be seen that the three samples were not even in the same general cluster. This might in part be due to the gritty nature of the source material, which proved difficult to grind by pestle and mortar, but it is disconcerting that the clay source cannot be characterized by the technique since the pottery vessels which are potentially open to more variation and contamination in the process of manufacture and will therefore be even more difficult to fingerprint. The samples which were taken from near Dun Cul Bhuirg, Iona and from Dun Mor Vaul, Tiree are also intermixed on the dendrogram, this

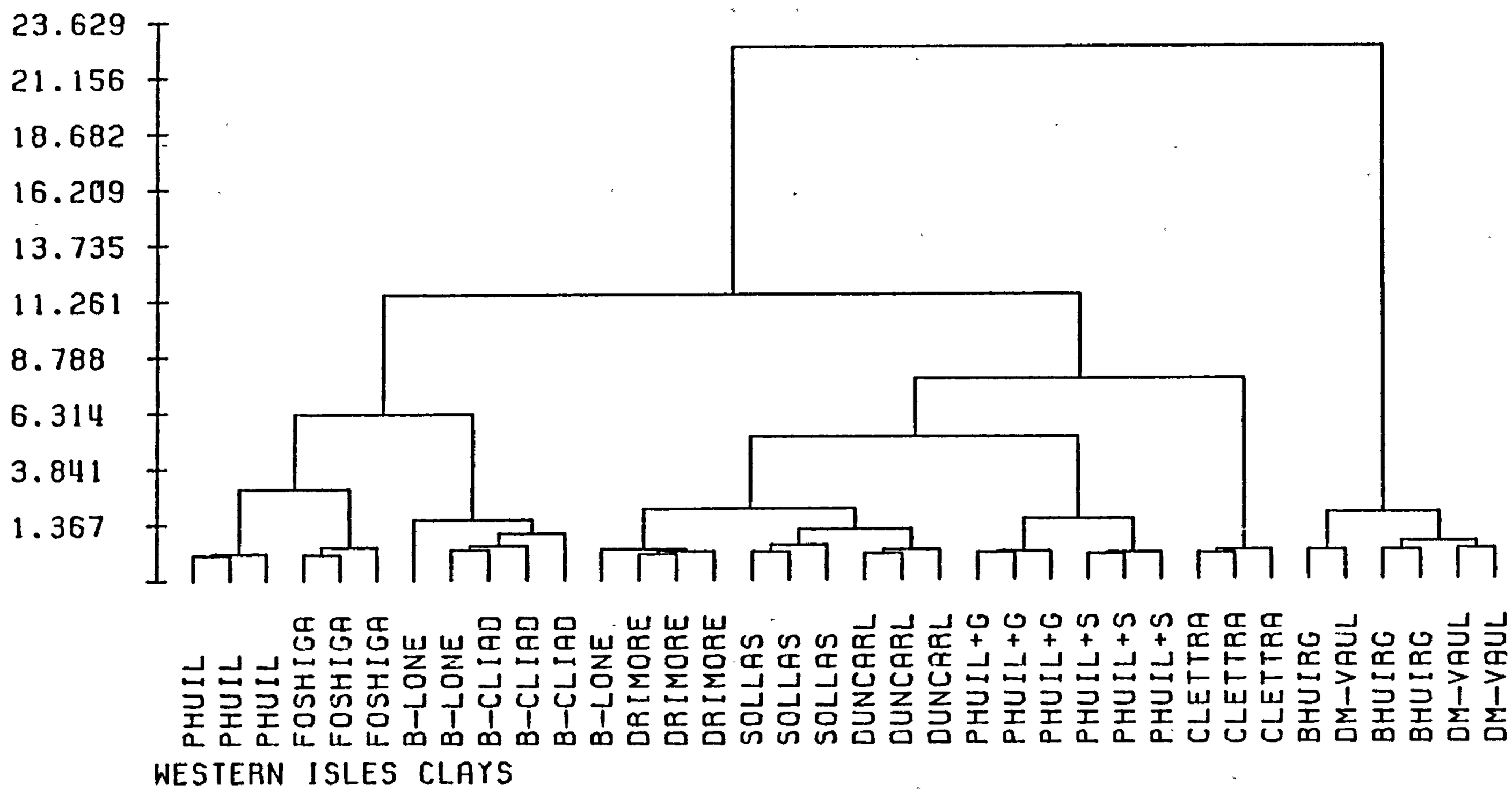


Fig. 12: Dendrogram produced from the raw data obtained by NAA for the sampled Hebridean clay beds.

might be explained by the nature of their raw composition. Both of the groups of three samples were noted at the time of collection to have had an element of humus/soil in their makeup, thus one would not have expected them to be as homogeneous as the true clays which were obtained.

The effects of temper upon chemical composition are demonstrated by the results for the Balephuil good potting clays. The three samples of pure untreated clay join at a low level on the dendrogram which indicates the greater homogeneity of the raw material relative to others which were sampled. The clay which had grass and shell added, however, whilst still demonstrating homogeneity as a sub group containing extraneous material, does not fall into the same general cluster as the parent clay. The implication for pottery production was apparently clear; namely that the addition of temper such as shell and sand could be expected to alter the NAA results to a degree, such that two vessels made from the same clay bed will apparently differ, by dint of having differing additives introduced in the manufacturing process.

Conversion to ratios

A visual examination of the data, however, indicated that although some of the samples had differing values for given elements, when in fact they came from the same clay bed, they did seem to follow a trend of being systematically higher or

lower with respect to all the elements. It seemed possible, therefore, that the observed differences in absolute values between clay beds could be better examined if they were presented as ratios of the selected elements divided by the element which was observed from the NAA programme output to have the smallest error associated with its detection. In addition it was desirable that the element should be highly stable chemically. The output for the entire run of 566 samples indicated, as summarized in Fig. 8, that it was Sc which had the lowest counting error in the NAA and which also had the advantage of occurring in virtually every sample, except for a few in which technical or human errors had made the recovery of the spectrum containing the Sc peak impossible. Accordingly a further database was constructed which contained the ratios of Sc to the elements La, Sm, Cs, Ce, Tb, Lu, Hf and Th. The statistical validity of the practise of converting the absolute figures to ratios has been questioned, (Bishop et al. 1982, 300) on the basis that while it may preserve the proportionality between elements in the clay, the effect of temper is unknown. In the case of the Hebridean clays, however, organic and shell temper were specifically added to study just this sort of transformation effect. The absolute values for the clays and for all the pottery sherds sampled, were converted into ratios by the division of Sc, and the results also stored on a CATALOG6 mainframe database. The CLUSTAN program was rerun using exactly the same procedures as above and the dendrogram in Fig. 13 produced. It can be seen that a much more

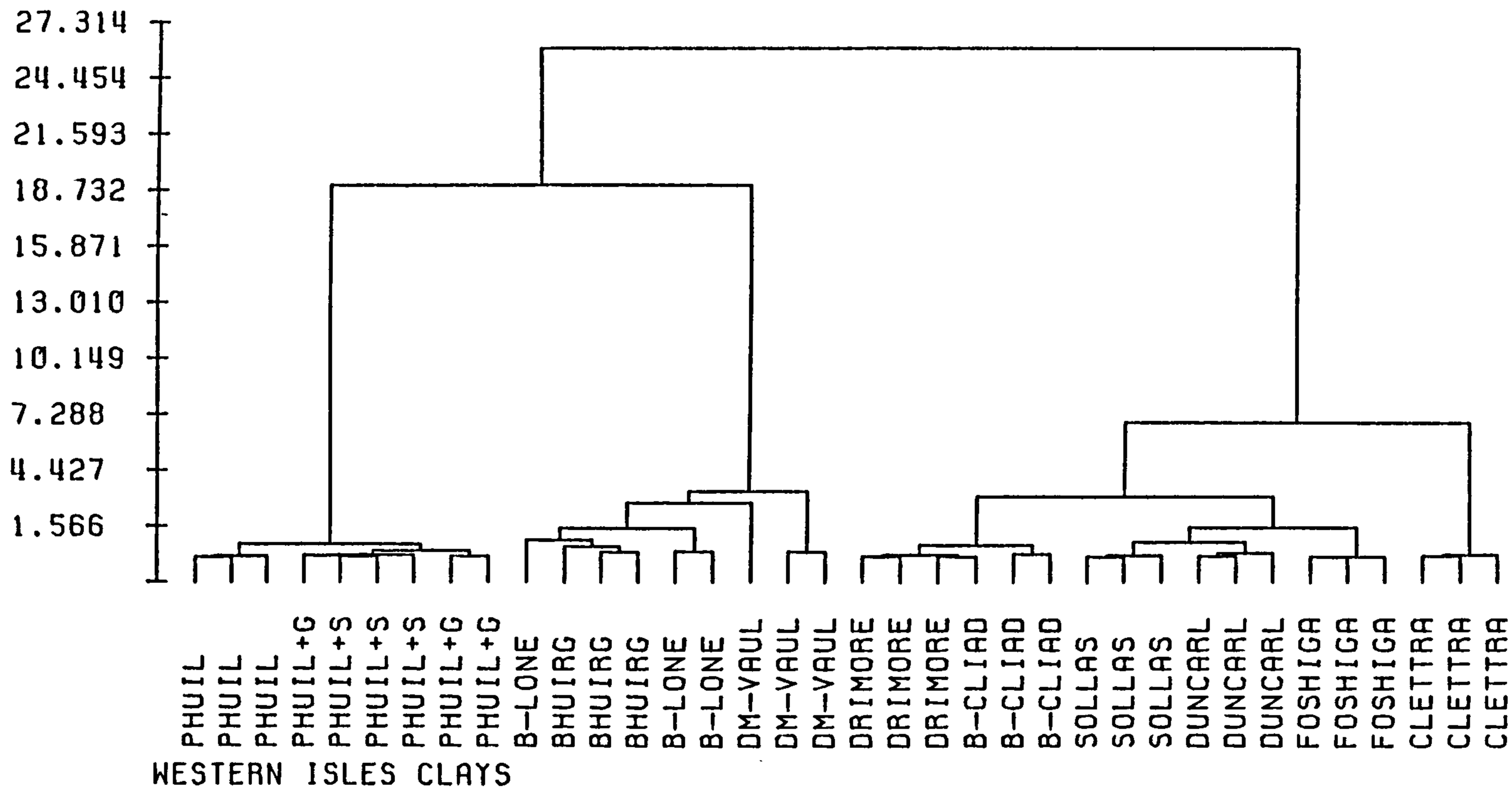


Fig. 13: Dendrogram produced from the ratios to scandium derived from the raw data.

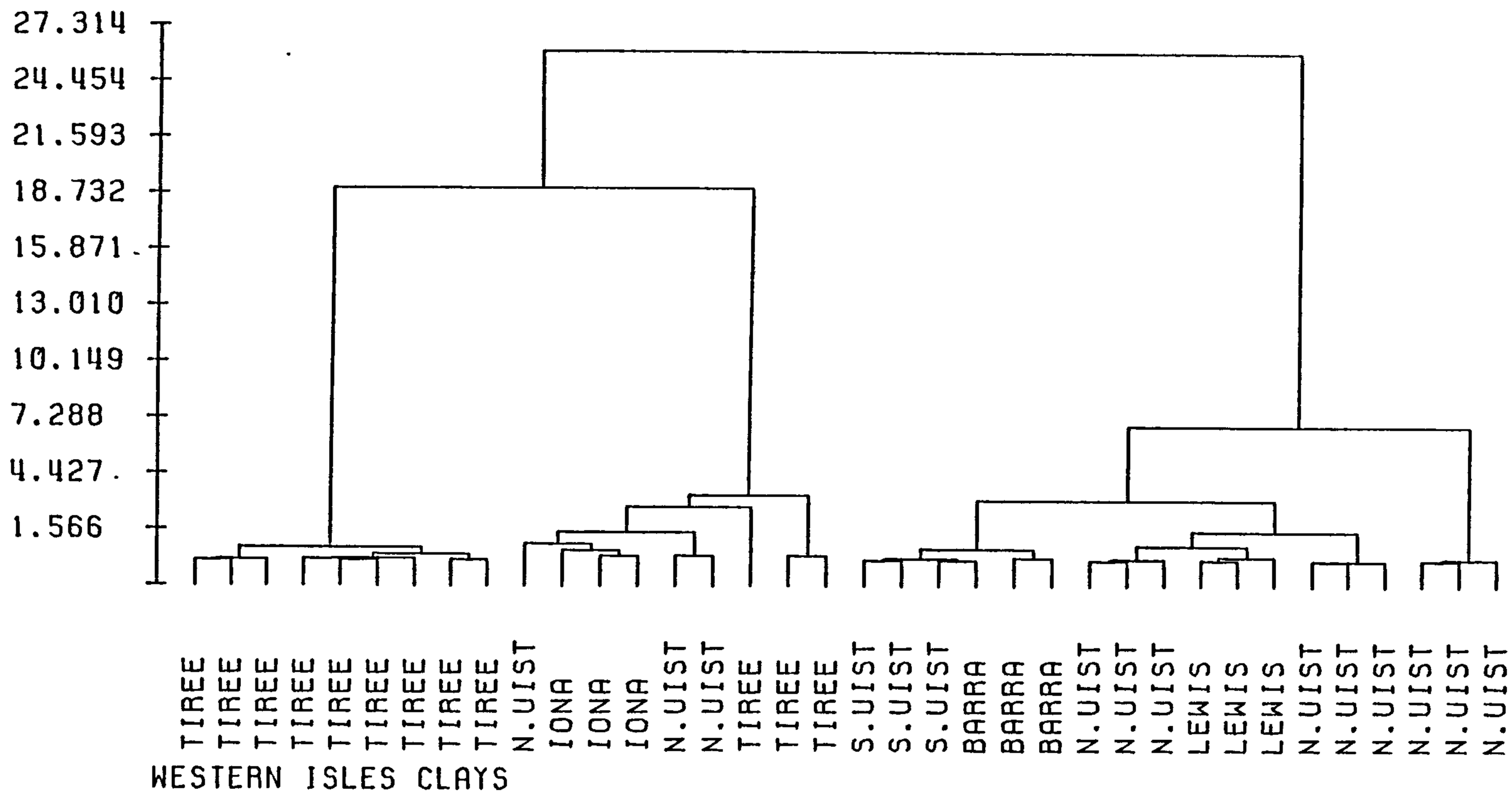


Fig. 14: Dendrogram produced from the same ratios as Fig. 13 but labelled by island of origin.

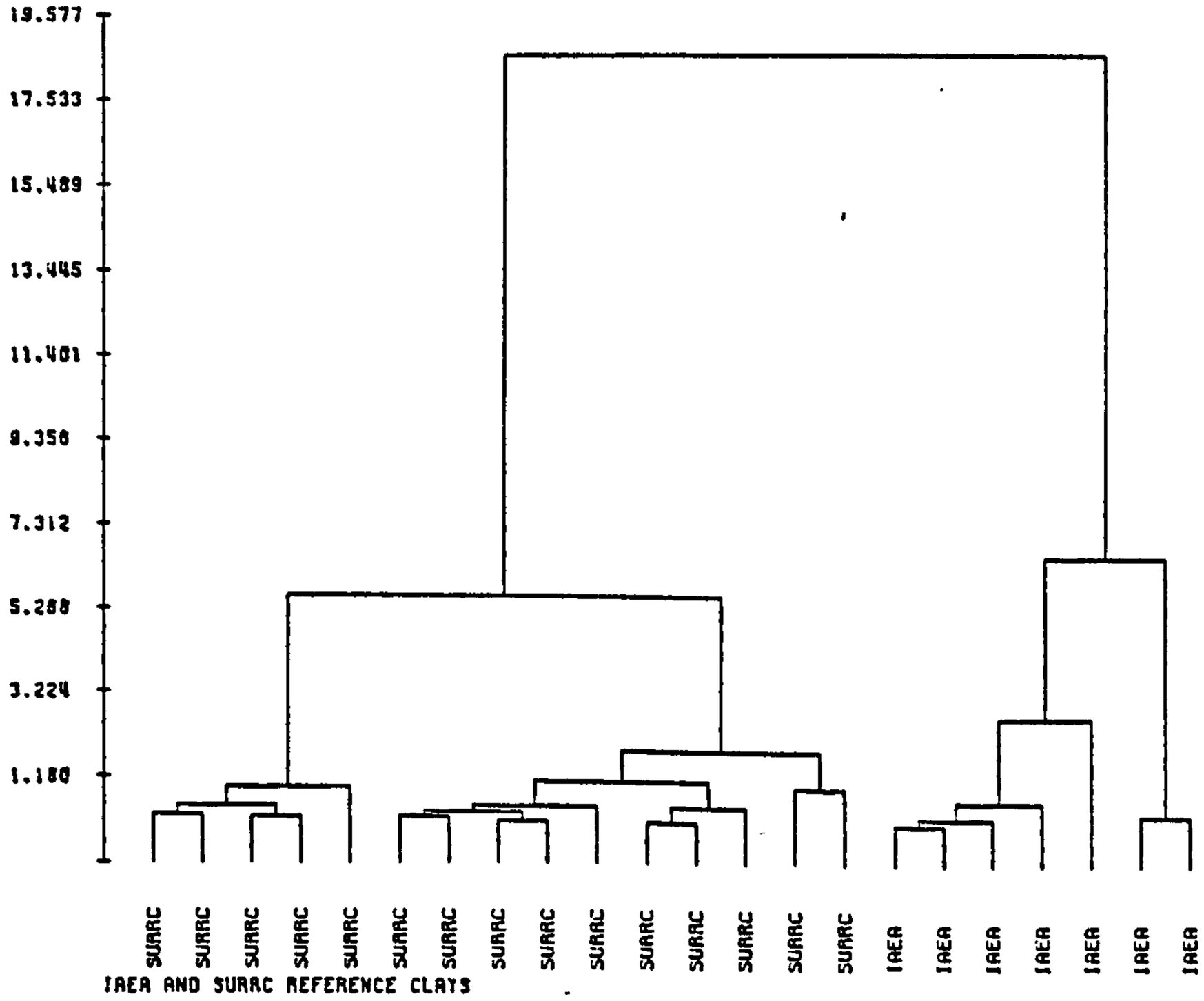


Fig. 15: Dendrogram produced from the raw data obtained by NAA for the IAEA and SURRC reference clays.

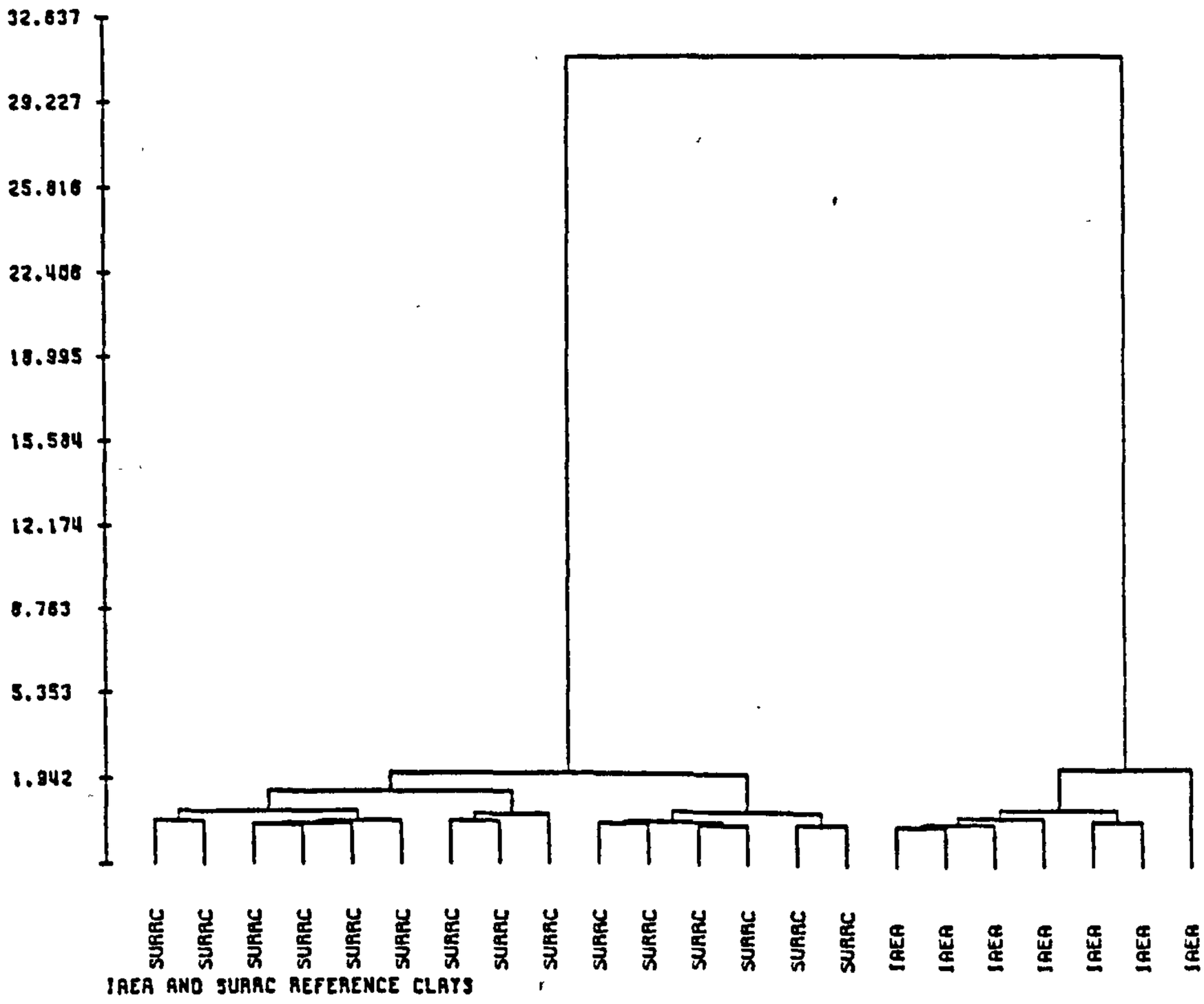


Fig. 16: Dendrogram produced from the ratios to scandium derived from the raw data obtained for the reference clays.

satisfactory grouping of the clay beds was achieved in general. Of particular significance is the fact that the effect of the temper which was added to the Balephuil clays was reduced so that the samples which had been treated were closer to the parent clay than to any other bed. This is of great potential significance as it means that clustering results which are obtained by means of the ratios are more likely to reflect real differences in vessels and areas of manufacture than those derived from the absolute figures. Fig. 14, however, demonstrates that although clay beds can on the whole be seen to be distinct, the geology of separate islands can not. This is a result which might be expected given the general similarity of the glacial history of many of the islands and the widely varying ages and parent sources of the clays analysed.

A similar test was also conducted on the data derived from the seven samples of IAEA clay and on the fifteen samples of SURRC clay. The dendrogram in Fig. 15 was produced using the absolute values for the nine elements and while it can be seen that CLUSTAN did manage to separate the two reference clays, neither of the clusters is particularly 'tight' and indeed there is the suspicion that four or more clusters may actually be present. The test was rerun using the ratios of the other eight elements to Sc and another dendrogram in Fig. 16 produced. The separation of the two groupings is much clearer and not only are the samples from the same parent clay seen to fuse at a lower coefficient of similarity, indicating greater

homogeneity of population, but the difference between the two clays is accentuated. On the basis of these trial runs of clustering by ratios, it was decided that the practice of conversion to ratios would be employed for all the sites and for every sample.

As has been discussed above, Cr was not used in the cluster analysis of the pottery data because it had been demonstrated to be potentially derived from the drilling burr. In the case of the natural clays, however, no drilling of the samples was involved with the implication that Cr concentrations observed in the samples were derived from the natural material. In this case therefore, the Clustan package was rerun using the Cr concentrations as a additional input to the programme and the dendrogram in Fig. 17 was produced.

The problem of deciding what level of branching in the dendrogram is statistically significant still remains, however, and although two different types of stopping rule tests are contained within the CLUSTAN package these were found not to be totally satisfactory, especially since the results depended in part upon the user's subjectively derived inputs. More conventional parametric statistical procedures were therefore employed using the Pennsylvania State University statistical package MINITAB on the Edinburgh University 2976 mainframe.

Significance of clusters

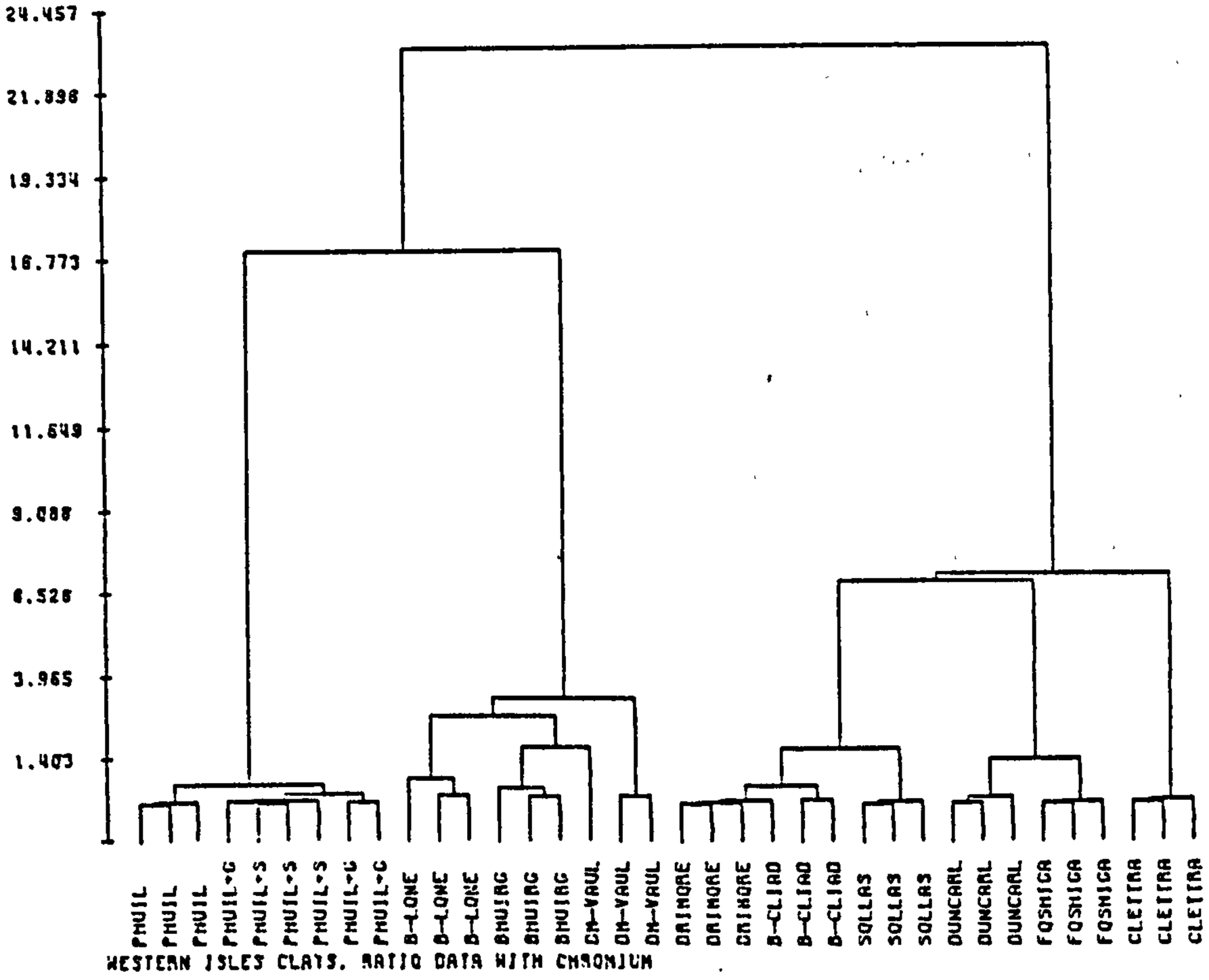


Fig. 17: Dendrogram produced from the ratios to scandium derived from the raw data, including chromium.

As a starting point it was accepted on the basis of these and other trials that the dendrograms which were produced using ratios contained information which although it may have been imperfect, did contain some useful structure. It is clear that no analytical and statistical procedures are perfect, yet the techniques which were employed were sensitive enough to be able to pick out clusters which did have some basis in geological reality. As a test of the statistical separateness of the clusters produced by CLUSTAN, it was decided to compare the means of the elemental values for each cluster against the cluster closest to it. The null hypothesis was created that there was no significant difference between the means of the individual elements within the clusters at a 95% level of confidence. The test was carried out using the MINITAB 'twosample t' test (Ryan et al. 1976, 140-142), which has the advantage over a normal 't' test in that the population variances are not assumed to be equal. Sample populations which were derived from datasets were tested for normality of distribution and were found to be satisfactory. The mean of each element with the two clusters being considered is calculated and a test statistic given for the probability of the null hypothesis being rejected. The 'twosample' test was first carried out on a variety of test cases to demonstrate that it could provide useful results in the interpretation of clusters. In the first instance it seemed prudent to examine a series of values which were known to have come from the same parent sample. The SURRC reference clay was one such example and the fifteen sets of

Fifteen samples of SURRC Reference clay divided into a group of the 7 earlier and 8 later samples.

Element	La	Sm	Cé	Lu	Hf	Th
Two sample T test P.	54.6	34.6	42.7	10.4	41.6	36.4
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	Yes

Null hypothesis: The 7 earlier and the 8 later SURRC samples come from the same populations.

Fig. 18.

Seven samples of IAEA Reference clay divided into a group of the 3 earlier and the 4 later samples.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	33.9	67.3	39.5	86.5	81.0	28.4
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	Yes

Null hypothesis: The 3 earlier and the 4 later IAEA samples come from the same populations.

Fig. 19.

Nine samples from Loch Tay divided into a group of the first 4 samples and a group of the last 5 samples.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	17.1	9.7	11.8	27.4	32.2	12.9
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	Yes

Null hypothesis: The group of 4 and the group of 5 samples from Loch Tay come from the same populations.

Fig. 20.

Six samples in 2 groups of 3 from the same sherd of pottery from Loch Ard.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	61.4	45.0	34.3	38.4	85.5	49.4
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	Yes

Null hypothesis: The 6 samples from Loch Ard come from the same population.

Fig. 21.

values which had been obtained for it throughout the NAA project were split into a group of the seven earliest and another of the eight latest analysed samples. The results for the 'twosample' test on the means of the groups are given in Fig. 18 and show that for the six elements La, Sm, Ce, Lu, Hf and Th there is a 95% confidence level that the two groups indeed derived from the same population. The elements Cs and Tb were not utilized in the test procedure because of the relatively high error of up to 20% which was associated with their analysis. Thus while they proved useful for clustering, as both elements could help to differentiate between parent clays, their error factor meant that for small sample sizes the calculation of the mean could fluctuate widely and affect the validity of the 't' test results. The same 'twosample t' test was also run on two groups for the seven values for IAEA reference clay and again the hypothesis that the two IAEA groups were derived from the same population was also accepted for all six elements (Fig. 19).

It was known, however, that both the reference clays were likely to have a more homogeneous structure than that which might be expected for prehistoric pottery and consequently the same test was applied to the samples derived from the Loch Ard and Loch Tay crannog sherds. The results for the nine sherds from Loch Tay, which were divided into two groups are shown in Fig. 20 and demonstrate that an equally convincing result was possible for pottery samples derived from one vessel. An identical pattern was also

recovered for the six Loch Ard samples taken from a single sherd and is shown in Fig. 21. The results of the application of the 'twosample t' test for the ratios of Sc to the elements La, Sm, Ce, Lu, Hf and Th were thus seen to provide proof that the technique of NAA and the subsequent statistical procedures were refined enough to pick out a good degree of the real pattern underlying the data. As a check the nine samples from Loch Tay and the six samples from Loch Ard were run against each other in the test and it can be seen in Fig. 22 that for three out of the six elements the agreement of the means was not statistically significant for the two groups to assert that both came from a common population. The fact that the null hypothesis was accepted for the other three of the elements may be due to similarities between the parent clays and perhaps due also to the small range of values in which certain of the elements occur in the Earth's crust. It was decided on the basis of these results that the 'twosample t' test did provide a useful means for differentiating between clays and accordingly it use was extended to the CLUSTAN results for the clay samples which were obtained in the Western Isles.

The first group to which the test was applied were the clay samples collected from Balephuil, Tiree and which had been either left pure, or which had been affected by the addition of temper in various forms. From the dendrogram it was noticed that the uncontaminated clay samples appeared to form a separate group from those which contained temper and the 'twosample t' test was accordingly run. The results in Fig. 23

Fifteen samples in 2 groups of 9 from Loch Tay and 6 from Loch Ard.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	7.7	1.2	4.9	39.7	12.9	0.6
Accept Null hypo.	Yes	No	No	Yes	Yes	No

Null hypothesis: The 9 samples from Loch Tay and the 6 samples from Loch Ard come from the same population.

Fig. 22.

Cluster One: Nine samples from Balephuil, Tiree, 3 pure clay, 3 with grass and 3 with shell temper divided into groups of the first 3 and of the latter 6.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	18.8	42.4	0.9	7.9	4.6	66.7
Accept Null hypo.	Yes	Yes	No	Yes	No	Yes

Null hypothesis: The 3 pure clay samples and the 6 samples with added temper come from the same populations.

Fig. 23.

show that for the elements Ce and Th there was a significant difference between the means of the populations and thus while the CLUSTAN results indicated a distinct cluster for the Balephuil clay, there were differences amongst the sample members. This in part may be due to the concentrated nature of the amounts of added temper, but indicates that there is the potential for distinguishing between pottery vessels which were manufactured on different chronological occasions using differing amounts of temper, although the parent raw material may have been a single clay source. The implication may be that for pottery vessels it will be the downright anomalous samples, or those groups of samples which in the light of the archaeological background are seen to form a recurrent pattern, which are the most worthy of explanation. One of the more reassuring results, which will be discussed in more detail in the relevant chapters, was that duplicate samples taken from single vessels from several sites always fell into the same statistical cluster as the original sample.

The next cluster examined was that formed by the samples from Sollas, N. Uist and Dun Carloway, Lewis. CLUSTAN had successfully separated the two clay beds but it had not determined if this was statistically significant. The 'twosample t' test results in Fig. 23 demonstrated that one of the six elements was statistically significantly different and consequently the significance of the CLUSTAN result was taken to be proven. The Sollas and Dun Carloway grouping was then compared with its nearest neighbour, the cluster of three

Six samples in 2 groups of 3 from Sollas, N. Uist and from Dun Carloway, Lewis.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	51.4	24.4	58.9	13.4	15.0	1.9
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	No

Null hypothesis: The total of 6 samples from Sollas and Dun Carloway come from the same populations.

Fig. 24.

Nine samples in 2 groups of 3 from Sollas, N. Uist and 3 from Dun Carloway, Lewis against 3 samples from Foshigarry, N. Uist

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	1.1	0.3	<0.0	80.3	85.5	58.9
Accept Null hypo.	No	No	No	Yes	Yes	Yes

Null hypothesis: The total of 6 samples from Sollas and Dun Carloway come from the same population as the 3 samples from Foshigarry.

Fig. 25.

samples from Foshigarry, N. Uist. This time the test values shown in Fig. 25 demonstrated that only three of the six elements were likely to have derived from the same population and the test was deemed proof that there was a significant difference between the two groups. As a further test of the groupings at a higher level in the dendrogram, the nine samples from Balephuil were compared with those in the next nearest cluster composed of the samples from Balelone, N. Uist, from near Dun Cul Bhuirg, Iona and from Dun Mor Vaul, Tiree. The test values in Fig. 26 decisively reject any belief that the two groupings are similar or that they derived from the same source. From these and tests which were carried out on other of the clusters in the dendrogram (Fig. 13), it was decided that the 'twosample t' test was a useful means of differentiating between significantly different clay beds. In general the important point to note is that the cluster analysis and the subsequent 'twosample t' tests demonstrate dissimilarity between clusters not homogeneity within clusters. Thus as will be discussed in following chapters, the fact that a piece of Samian ware, for example, falls into a cluster with Hebridean pottery, does not mean that they were manufactured from the same clay, rather that that particular cluster is in some way different to the others on the dendrogram.

Eighteen samples in 2 groups of 9 from Balephuil and 9 in total from Balelone, Dun Cul Bhuirg and Dun Mor Vaul.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	<0.0	<0.0	<0.0	<0.0	5.9	<0.0
Accept Null hypo.	No	No	No	No	Yes	No

Null hypothesis: The 9 samples from Balephuil and the total of 9 samples from Balelone, Dun Cul Bhuirg and Dun Mor Vaul come from the same population.

Fig. 26.

Chapter Three: Iona.

'Perhaps in the revolutions of the world,
Iona may be sometime again the instructress
of the western regions' (Johnson 1817, 237).

Geological background.

Iona, lying off the south western tip of Mull, was the furthest south of the Western Islands from which pottery was selected for sampling by NAA. Geologically the island is distinct from the nearby Ross of Mull being separated from it by virtue of lying to the west of the Moine Thrust and thus lacking the distinct red granites of the latter island. The western part of Iona, including the rock on which the fort of Dun Cul Bhuirg stands, consists of Lewisian gneisses containing two main mineralogical compositions; pale pink or grey quartzo-feldspathic gneiss with hornblende and chloritized biotite, and basic hornblende-gneisses with albite as the dominant feldspar (Peach and Horne 1930, 69). In the south of the island lie metasediments which contain forsterite-tremolite-marble, and this extends northwards in a prominant massive band of pegmatite which occasionally emerges in places as a flinty material with a conchoidal fracture.

In the eastern part of the island the Lewisian gneiss is succeeded by Torridonian sediments of sandstone and grit. Mineralogically these contain quartz, feldspar, plagioclase, albite, ilmenite, orthite, zircon and chlorite. Some of the

Torridonian rocks display dynamic metamorphism, with shearing having led to the elongation of pebbles within the sediments and also to the development of sericitic mica and of secondary epidote and chlorite. During the fieldwork to obtain samples of potential potting clays, a sample from a clay/humus layer at the side of a roadside ditch was taken (NGR NM 276236), as no other more satisfactory source could be located. It was known that a blue clay, probably marine in origin and laid down circa 11000 B.C. did exist on the island (Mate 1982, 282-287), but its occurrence at the bottom of a 2.9 metre deep trench, now no longer accessible, meant that it could not be sampled. The results obtained from x-ray diffraction, indicated that the major mineralogical constituents of the sample which was taken were quartz, albite, chlorite and muscovite. The occurrence of the first three is not inconsistent with the geological chemistry of the island, however, the processes affecting the composition of deposits overlying parent rocks are known to be complex (Campbell 1984, 36-37) and so while the rocks of Iona may have provided the parent material of the sample, no such relationship can be definitely asserted.

History of archaeological investigation.

Dun Cul Bhuirg is one of the two prehistoric monuments on the island of Iona and is situated on the top of a steep rocky hill at a height of 51 m OD facing the Atlantic ocean to the west (Fig. 27). The summit of the hill at NGR NM

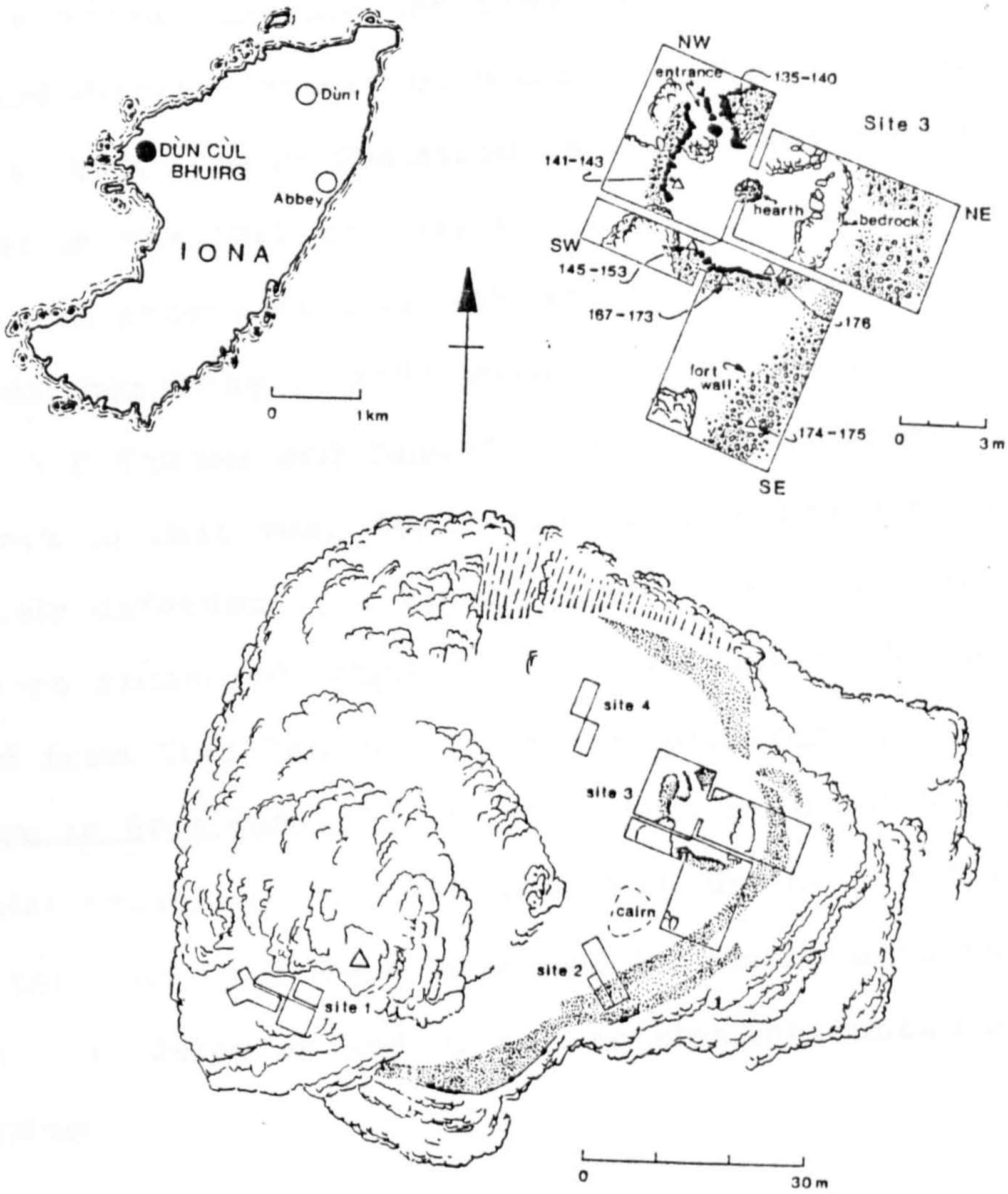


Fig. 27: Dun Cul Bhuirq site plans and pottery rim profiles.

265246 (not 274247, Ritchie and Lane 1981, 209) measures 45 by 35 m and displays traces of walling on the NE, E and S sides. It is traditionally described as a fort and though first noted in the 19th century it received little serious archaeological attention until the series of modern excavations, beginning in 1957 with work directed by Professor A C Thomas and funded by the Russell Trust. Initial work in that year demonstrated that the summit had been loosely defended by a single rampart, and several sherds were recovered which were comparable with those recovered from Tigh Talamhanta, Barra (Discovery & Excavation in Scotland 1957, 11) This was followed by more substantial excavation in 1958 and 1959, during which four sites within the fort were examined to assess both the nature of the defences and of any settlement contained within them.

Site one was a small terrace to the southwest of the summit and was excavated by quadrants during 1958 and 1959. The remains of what had been a small hut were recovered with associated artefacts including pottery and a flint scraper. These finds were thought lost at the time of the publication of the site report. Site two, a cutting through the walling on the southern side of the fort, was excavated during 1959. A band of displaced wall 2.2 metres wide and at a maximum 0.7 metres high was uncovered, revealing a wall core of large stones, beach pebbles, soil and patches of seashell. On the interior side of the fort, the bedrock was reached

with four other layers superimposed above it. Small finds recovered during the 1959 excavation included cattle, sheep, pig and seal bones (Noddle, 1981, 225), as well as a yellow annular, class 8, glass bead and over forty rim, base and body sherds of pottery. In 1968 a further extension to the section across the wall debris was cut by Dr. R. Reece in an attempt to recover more information on animal bones from the site. Further sherds and a translucent glass bead of class 14 were also found.

Site three, the terrace on the east side of the fort, was excavated by quadrants during 1958 and 1959, during which the remains of a hut were located. Two lines of reveting facing stones supported a wall on which the roof would have rested on the western side. On the east the natural rock outcrops could have provided roof support, though the debris from the fort wall obscures the detail of the eastern part of the hut as a whole. The hut interior measured almost 20 m^2, and included a well defined hearth some 0.75 by 1 m in size, though this contained no traces of burning. The entrance was in the north-western quadrant and the excavation recovered material from a number of contexts, including a dark occupation level. In 1981 only the pottery from the north-eastern quadrant was known to be extant, although shortly after the publication of the report the rest of the material was refound, adding further sherds to the pottery and glass bead of class 8 that were known to have come from the site. The fourth of the sites excavated

was the low platform flank of the rocky outcrop. Two trenches were dug to the natural bedrock, and although eight pottery sherds were recovered, no structural remains were encountered, this perhaps partly being due to the smallness of the area excavated.

The main excavation and the additional 1968 material was published by Drs G Ritchie and A Lane (1981, 209-229) almost 25 years after the initial investigations, and in the intervening period much of the small find material from the site was thought lost. In particular all the pottery from site 1 and from the NW, SW and SE quadrants of site 3 was missing, as well as a number of the more diagnostic rim sherds from a variety of the other locations. In 1981, however, a collection of several hundred sherds from an unclear provenance was presented to the National Museum of Antiquities of Scotland and after examination of both the pottery and the context notes contained with it, Dr Ritchie and Mr T Cowie deduced that these were possibly the missing sherds from Dun Cul Bhuirg. Ironically, after being missing for 25 years, the presentation occurred only some few weeks before the site report was published and too late for any amendments to be made, or for a note to this effect to be included.

<u>Site 1: the lean-to shelter.</u>

Site 1, the terrace to the SW, was excavated by

quadrants during 1958-59 (Fig. 27), uncovering a total area of almost 15 m^2. A possible occupation layer was exposed, with an associated area of pebble flooring, while to the N was an area of burning against the rock face, perhaps indicating an area of hearth. The lack of more substantial evidence of occupation, combined with a paucity of stonework has led to this area being regarded as a campsite, which utilised the rock face to the N as a supporting side for a lean-to structure Discovery & Excavation in Scotland 1958, 15). Some of the sherds which were recovered were described as coming from a possible occupation layer of dark gritty humus. This apparently lay above an area of stones which may have formed a floor level of the structure. It was previously believed that finds recovered from site 1 had included some 40 sherds of pottery and that 1 had been a rim with 'dimple' decoration (Ritchie and Lane 1981, 210). Also recovered were a flint and a pebble smoother, the latter being the sole find known to be extant in 1981.

Of the small finds boxes which were found and presented to the NMAS in 1981, 3 contained pottery which can be ascribed to quadrants of site 1, namely the SW, SE and NW. In total 45 brown and buff coloured sherds were present and these can be confirmed as being the pottery thought to be lost. Of the sherds 2 had everted rims and a row of fingertip impressed dimples in the rim angle (no 107). These rims are not paralleled in decoration by sherds from others

of the published parts of Dun Cul Bhuirg, though similarities can be noted with some of the refound material from site 3. A sherd with broadly similar decoration was recovered from the furnace of the wheelhouse at A' Cheardach Bheag, S Uist, (Fairhurst 1971, fig 7, no 1), although in addition this had an abraded carination inside the rim neck, possibly for supporting a lid.

One sherd was marked by several striations (no. 110) and another bore a shallow fingertip impressed groove (no. 109). The remaining 41 sherds from the SE quadrant contain organic inclusions and some may be from the same vessel as the two dimple decorated rims. In addition, two rounded pieces of reddish buff fired clay, which did not appear to have been derived from a pottery vessel, were recovered (no 111), 1 of them had a flat broad groove 12 mm across and it may be that both are parts of an oven or furnace capping, similar to material that came from sites 3 and 4 (Ritchie and Lane 1981, nos 26 & 55). Other artifacts included a rounded stone pebble 24 mm in diameter. This perhaps functioned as a counter of some form, with other examples from the Western Isles being those from Dun Mor Vaul, Tiree (MacKie 1974, fig 12, no 83 & fig 17, no 322).

The NW quadrant (fig 27), produced a number of artifacts including 8 pottery sherds and a piece of flint; all were from a level described as being dark soil above stones. The largest sherd (no 113) is brown and reddish

buff, with a rolled and everted rim, and contains many small grits. There are no immediate parallels from Dun Cul Bhuirg, or indeed from other Hebridean sites, although there is some likeness to sherd no 130 from site 3. The remainder of the sherds were either very small or fragmentary as were the 2 undiagnostic sherds which came from the SW quadrant (no 115).

Site 2: the section through the fort wall

It is unfortunate that of the rediscovered sherds, none can be identified as those site 2 diagnostic rims which were not located by Drs Ritchie and Lane. The remainder of the sherds from site 2, which comprised the bulk of the material known to exist in 1981, and the missing rim sherd profiles, were considered in detail by them (Ritchie and Lane 1981, 212-218). The pottery from site 2 numbers 129 sherds and 1 fragment of fired clay, of which total 16 rim sherds can now no longer be located. This is particularly regrettable as some of the sherds come from a group (nos. 45-52) which occupied a well stratified location in the undisturbed occupation deposits within the fort. As with most of the pottery from Dun Cul Bhuirg, the material from site 2 as a whole ranges from dark brown to reddish orange in colour, with some sherds also displaying a sooty encrustation (eg. nos 35 and 73). One sherd (no. 73) from the group was examined by G.H. Collins, Institute of Geological Sciences, who identified fragments of finely crushed granitic gneiss

and hornblende crystals, both of which though occurring widely, also exist on Iona, leading him to suggest a local origin for the pottery (Collins, 1981, 224). Another sherd (no. 60) which was noted to have organic inclusions was examined by C.A. Dickson, University of Glasgow, who identified a carbonised fragment of a glume, probably belonging to hulled barley, as well as a seed impression, also likely to be of the same cereal (Dickson 1981, 224). In addition, many of the other sherds (eg. nos. 42, 56, 58 and 77) have clear signs of having had organic material of some sort actually contained within the matrix, and in more than one case the exterior of the vessel itself appears to be grass wiped (eg. no. 74).

Of the sherds from site 2, 19 were rims, though of the 17 recovered during the 1959 excavations, only 1 (no. 34) is now known to exist; fortunately drawings were made of those now lost. Base sherds which were found included, 3 in 1959, and 2 during the extension of the section in 1968. The fragment of fired clay (no. 61) has clear impressions of a small stick or withy, and it is similar to, or may be indeed part of, the oven or furnace capping from site 3 (no. 26). Two sherds (nos. 63 and 64) were attributed to site 2 by Lane and Ritchie in their catalogue of the material from the site (Ibid, 222). Both sherds, however, were apparently stored within an envelope marked 'DB 3 SW', and since this is the designated code for site 3, south-western quadrant on all the boxes of the rediscovered material, it seems likely

that they infact belong to site 3.

Many of the sherds from site 2 are too small to be of much value in searching for parallels in manufacturing technique or design, although this is not the case for all. Sherds no. 32 and 33 are now missing, but the rim profiles for these and others are shown in Fig. 27. Sherd no. 32 has a short everted rim with an applied wavy cordon in the neck angle, similar rim type and decoration can be found on many sites throughout the Western Isles, including Dun Mor Vaul, Tiree (Mackie 1974, fig. 18 nos. 363, 379) and Clettraval, N. Uist (Scott 1948, Pl. XII nos. 11 and 12). Sherd no. 33, also not now located, was a short plain everted rim; a type very common throughout the Hebridean chain with examples from many broch and wheelhouse sites. Sherds nos. 34, 38, 39 and 41 also had a short, but very sharply everted rim, a feature noted at Dun Mor Vaul (Mackie 1974, fig. 12 no. 99, fig. 13 nos. 119, 162, fig. 18 no. 422) and at Clettraval, N. Uist (Scott 1948, fig. 5 type 1b).

Sherds nos. 40 and 44, also missing, display a rolled over rim, a feature which, though occurring on several Hebridean sites, is not common on any of them. At Tigh Talamhanta, Barra two excavated sherds exhibited the type, (Young 1953, fig. 5 nos. 19 and 30) one of which also had an applied wavy cordon just beneath the rim. Another rim type from Dun Cul Bhuirg, site 2, was the out-turned rim (nos. 46, 50, 62 and 78), in some cases this was slightly flaring

as well (nos. 47 and 51). Interestingly this trait, is not so readily found in abundance on sites from which other parallels in rim type were noted; it does occur, however at Dun Cuier, Barra (Young 1956, eg. fig. 9 nos. 51-55), at Dun Scurrival, Barra (Young 1956, fig. 2 no. 1), and at Dun Carloway, Lewis (Close-Brooks 1977, fig. 4 no. 16). Rim sherd no. 78 in addition had three round stab marks on the exterior, possibly made with a bone fragment, and two grooved lines meeting in the point of a chevron. The rim with the incised chevron can be paralleled at Balevullin, Tiree (Mackie 1964, fig. no. 54) and the rim with chevron and dots at Dun Mor Vaul, Tiree (Mackie 1974, fig. 19 no. 468).

There was one example of an inturned rim, though this is not known to survive in itself or in the form of a drawing, making the search for similarities from other sites less satisfactory. Nevertheless, inturned rims have been found at Dun Cuier, Barra (Young 1956, eg. fig. 9 nos. 73 and 74), Balelone, N. Uist (unpublished, SDD, eg. find no. 63/20/73) and from Galson, Lewis (unpublished, NMAS, HR 955). One rim of a plain, or rounded nature, was found during the 1968 extensions to site 2 (no. 75), although as noted by Lane and Ritchie (1978, 223), it is more everted than the illustration in Fig. 28 would indicate; it seems infact to be the flange of an everted rim which has been broken off from the rest of the vessel and thus cannot be treated as a rounded or plain rim proper.

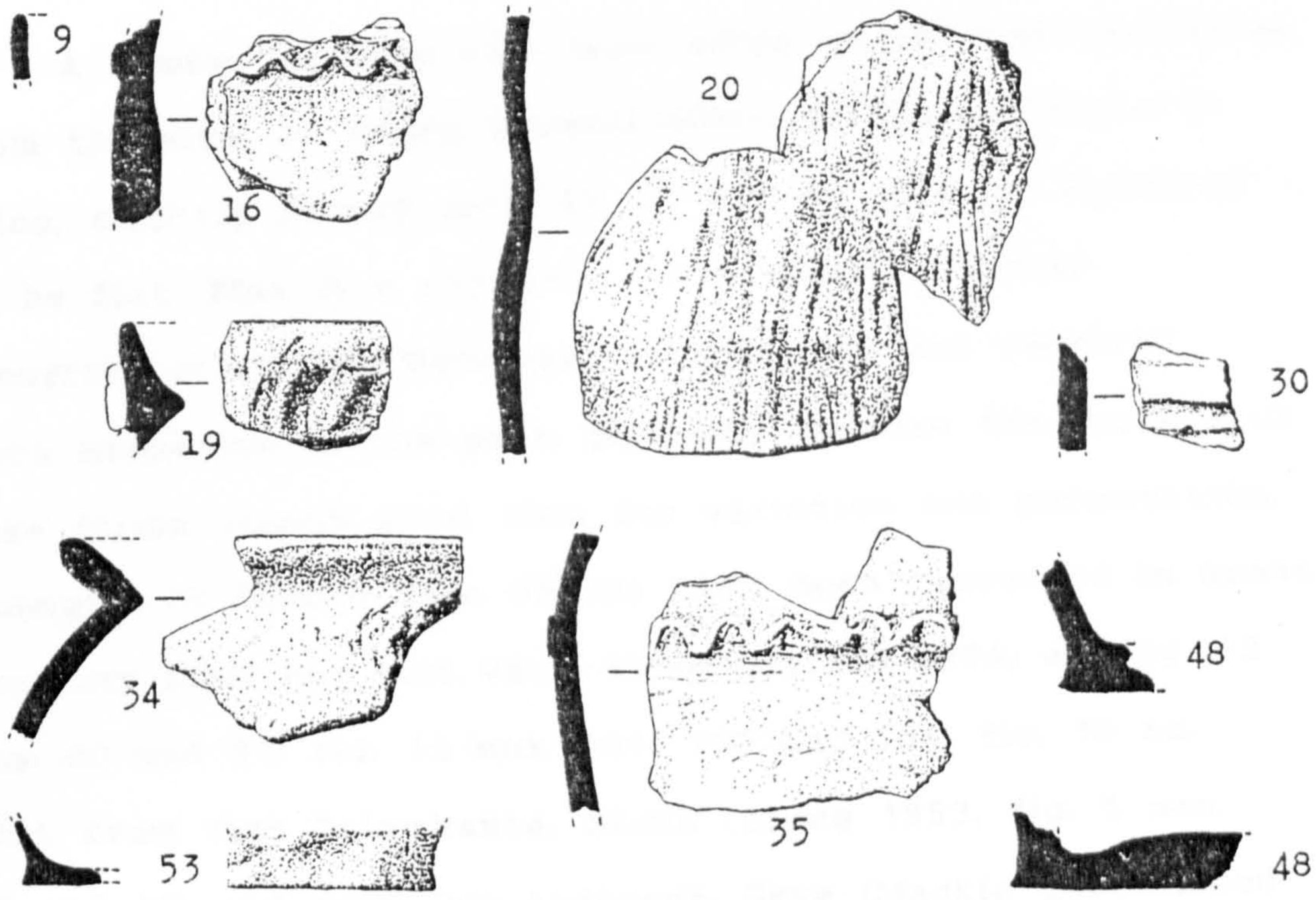


Fig. 28: Dun Cul Bhuirq pottery (after Ritchie and Lane 1981).

A number of base and basal angle sherds was recovered from the site, of which several were, or showed signs of being, slightly footed (nos. 42, 48 and 56) and all appeared to be flat. This is a stylistic trait which, although occurring in all the Hebridean islands, has not received much attention in the past, probably because the variety of base forms cannot rival rims for variation and permutation. Examples of footed base sherds have been recovered in great quantity from Dun Mor Vaul, Tiree (Mackie 1974, eg. fig. 12 nos. 80 and 81, fig. 13 nos. 141, 150 and 151, fig. 18 no. 425), from Tigh Talamhanta, Barra (Young 1953, fig. 5 nos. 32 and 36) and from Dun Ardtreck, Skye (Mackie unpublished proofs, fig. 7 no. 9, fig. 8 no. 40).

The most common decorative features applied to the sherds were the applied cordon, both wavy and fingertip impressed, and the existence of striations on the surface of the sherd, though whether this is a deliberate trait, or a consequence of some manufacturing process is unclear (Ritchie and Lane 1981, 214). Whatever is the case, it could still be a distinguishing feature of pottery from a given site, and thus may of value in assessment of groupings or wares. Wavy or zigzag cordons were represented as already indicated, on one rim (no. 32) and on body sherd no. 35, for which many parallels could be found from other sites, such as Tigh Talamhanta, Barra (Young 1953, fig. 6 nos. 44-47), Dun Cuier, Barra (Young 1956, fig. 10 nos. 82-89) and Dun

Mor Vaul, Tiree (Mackie 1974, fig. 12 no. 109, fig. 13 nos. 125 and 167). Applied cordons impressed with fingertip decoration (no. 76) also have a wide distribution occurring at Tigh Talamhanta, Barra (Young 1953, fig. 5 no. 54 and Pl. VII), Dun Cuier, Barra (Young 1956, fig. 11 nos. 93-95), Dun Mor Vaul, Tiree (Mackie 1974, fig. 18 nos. 384 and 385) and Dun Carloway, Lewis (Close-Brooks 1977, fig. 6 no. 39).

The other common feature, possibly caused by grass wiping, was the existence of striations, occurring on some sherds horizontally and on others vertically (eg. nos. 47, 50, 70 and 71). In the case of one other, the striations were of an arcing nature (no. 74). Grass marking and wiping is again a very common feature, occurring on many sites including Dun Cuier, Barra (Young 1956, fig. 9 no. 66), Dun Iardhard, Skye (MacLeod, 1915, fig. 13 second row, right and left), Dun Carloway, Lewis (Close-Brooks 1977, fig. 4 no. 12, fig. 6 no. 43) and A Cheardach Bheag, S. Uist (Fairhurst 1971, fig. 6 nos. 1 and 4). Striations on the surface of sherds can be caused by a variety of techniques, perhaps as mentioned by grass wiping, but also by brushing; as a form of surface marking it was noted amongst others at Dun Mor Vaul, Tiree (Mackie 1974, fig. 13 no. 169, fig. 14 no. 185) and A Cheardach Mhor, S. Uist (Young and Richardson 1960, fig. 10 no. 45 and 59).

A single sherd (no. 77) displayed two small curvilinear impressions, whose full outline was missing owing to the

break in the vessel. It seems most likely that these are parts of the impressions made by a ring headed pin which was pushed into the still damp clay. Ring pin stamping is a decorative feature which has been recovered from several sites throughout the Hebridean chain, though never in large quantities from any one site. The impressions from other sites vary, though most are probably formed by projecting ring heads (Mackie 1974, fig. 11 no. 16, fig. 12 no. 87), (Young 1953, fig. 7 nos. 61, 62, 65 and 67, and Pl. VIII). As a decorative technique it is easily recognizable and for this reason, in part at least, it has one of the largest distributions of any decorative feature of pottery found in the Western Isles. Ring impressed pottery occurs, in small numbers of sherds, in all the major islands with northern examples being noted from two sites in Orkney (Young 1953, Pl. IX. nos. 2 and 3), in general it is found in association with other forms of incised decoration on the same sherd, . for example at Dun Ardtreck, Skye (eg. Mackie unpublished proofs, fig. 8.31), rather than occurring in isolation.

Site 3: the hut, North East quadrant.

The bulk of the Dun Cul Bhuirg pottery refound in 1981 comes from site 3 from the north-western, south-western and south-eastern quadrants (Fig. 27), thus completing the assemblage, as the material from the north-eastern quadrant was in existence when the report was published by Drs. Ritchie and Lane. Sherds nos. 19-29 from this latter

quadrant were all recovered from a floor level which contained bone and charcoal. Of the 11 sherds, four were rims of which only 1 now survives, it is short and sharply everted, with a fingertip impressed cordon in the neck. Similar sherds were recovered from Dun Mor Vaul, Tiree (Mackie 1974, fig. 19 no. 435, fig. 16 no. 241). Of the other missing sherds, 2 probably had everted rims (nos. 27 and 29), with parallels in the collection from site 2, as with many other Hebridean sites. Sherd no. 27, with a more sharply everted rim, however, had additional parallels with sherds from Dun Mor Vaul (Mackie 1974, fig. 12 no. 99, fig. 13 nos. 119, 162, fig. 18 no. 422) and at Clettraval, N. Uist (Scott 1948, fig. 5 type 1b).

The fourth rim sherd was out turned, again paralleled on site 2 (nos. 46, 51 and 62) and on other sites, such as at A Cheardach Mhor, S. Uist (Young and Richardson 1960, fig. 5 no. 2) and Balevullin, Tiree (Mackie 1963, fig. 3 nos. 26 and 27), though the Dun Cul Bhuirg sherds lack the incised decoration associated with these examples. The remainder of the pottery collection from the north-eastern quadrant was composed of body sherds, a number of which bore decoration or marks of construction. Two sherds (no. 20) had external striations which were very similar to another sherd from site 3, but from the south-western quadrant (no. 172), whilst nos. 23 and 24 displayed an applied cordon, in the case of the former fingertip impressed, and in the case of the latter zigzag. Sherds similar to no. 23 are again very

common in the Western Isles, with examples from Dun Mor Vaul, Tiree (Mackie 1974, fig. 12 no. 93, fig. 18 no. 384), from Dun Cuier, Barra (Young 1956, fig. 11 nos. 93-95) and from Dun Carloway, Lewis (Close-Brooks 1977, fig. 6 no. 39). As was also noted for the zigzag cordoned sherds from site 2, this trait similarly has a wide distribution. In addition to the sherds, 3 fragments of fired clay were recovered (no. 26), it was thought these might have been part of an oven or furnace capping (Ritchie and Lane 1981, 221).

Site 3: the hut, North West quadrant.

The largest number of sherds refound during 1981 come from the north-western quadrant of site 3; this seems to have contained several parts of walling as well as the entrance to the hut. The sherds are also largely assignable to contexts within the quadrant itself, as each of the small boxes within which the sherds were packed, contained brief notes of the associated layer and structural remains. Finds nos. 116-119, some 108 sherds and pieces of fired clay came from below the turf and above a level of stones. Sherd no. 116 was the basal angle of a small, fine vessel with a black deposit on the interior, sherds no. 117 bore broad shallow grooves, similar to sherd no. 30 and to a sherd from Balevullin, Tiree (Mackie 1963, fig. 2 no. 7), though this may not be significant if the feature is more unintentional than deliberate during pottery manufacturing processes. The 9 lumps of fired clay (no. 118), though larger than those

pieces recovered from the north-eastern quadrant (no. 26), would appear to have derived from the same source, and as two bore marks of withies, one being 1 cm. in diameter, the other of indeterminate size, their interpretation as a capping of some sort would seem correct. The remaining 96 pieces of pottery from this layer are all body sherds from several different vessels, and although several exhibit clear construction breaks, their value as geographical or chronological markers is limited.

A further 43 sherds came from a dark soil layer above and outside the hut wall, the context is not precise but seems to be on the north-western side of the quadrant. A thick, flat topped rim sherd of a type not previously recovered from the site was excavated (no. 121). In addition it bore part of what was once an oval perforation, with a minimum span of 9 mm, perhaps a means of suspension for the vessel. Three sherds preserved parts of applied cordons, one worn fingertip impressed (no. 122) and one zigzag (no. 123), with parallels as noted for similar sherds from the N.E. quadrant. The third example was of an unusual type, having a very heavy cordon crossed by vertical slashes to give a square 'box' effect, and with the centre of each 'box' bearing a deep impression made by some round pointed object. This sherd has few exact parallels, though some similarity might be noted with an unpublished sherd from Buaile Risary, N. Uist, which had a cordon with a row of impressed dots upon it (NMAS, GT 581).

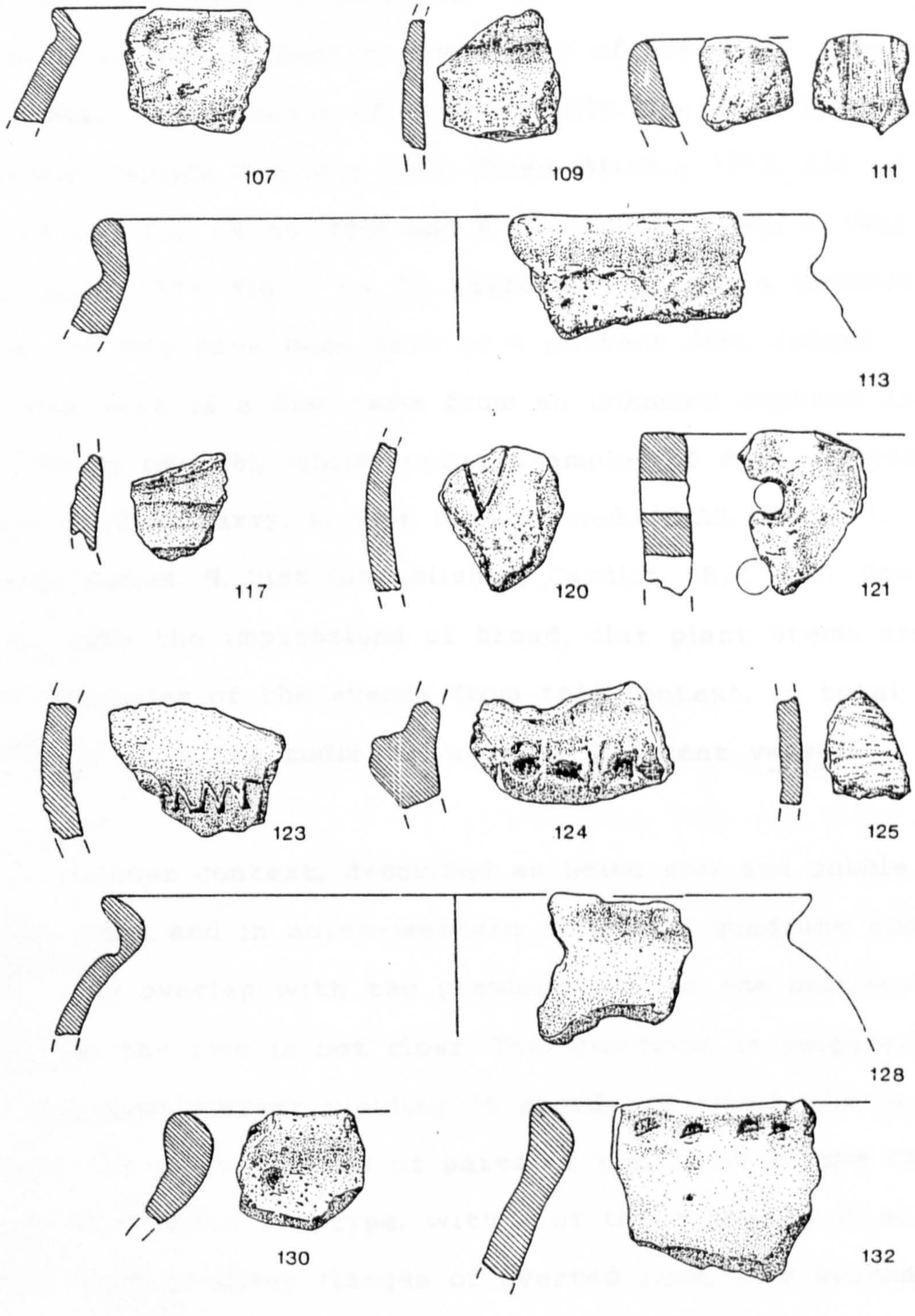


Fig. 29: Dun Cul Bhuirg pottery. Scale 1:2.

Incised decoration consisting of the tip part of a chevron was found on sherd no. 120 and while little of the pattern exists to identify what part of the total decoration it formed other sherds of a potentially like type from the Hebrides include Dun Mor Vaul, Tiree (Mackie 1974, fig. 12 no. 68 and fig. 14 no. 195) and A Cheardach Bheag, S. Uist (Fairhurst 1971, fig. 5 no. 2). Sherd no. 126 had a rounded edge and may have been part of a pottery disc, indeed another part of a disc came from an unknown context at Dun Cul Bhuirg (no. 86), whilst other examples of such objects occur at Foshigarry, N. Uist (unpublished, NMAS, GNA 311) and at Sollas, N. Uist (unpublished, Cardiff, SB/C13/9). One sherd bore the impressions of broad, flat plant stems and the remainder of the sherds from this context, in total some 36, were from the bodies of several different vessels.

Another context, described as being soil and rubble 'down west and in north-western corner of quadrant above wall' may overlap with the previous one, as the distinction between the two is not clear. This suspicion is heightened by this new context yielding 18 sherds, of which the large proportion were 13 rims or parts of rim. Most of the sherds were of everted rim type, with 7 of the 8 sherds of no. 131 being most probably flanges of everted rims, now broken off from the rest of the original vessel. Sherd no. 128, though also everted, was unusual in that the flange was both very sharply turned out and downward curving, a feature not

otherwise noted from this site, and indeed not common on others. A further everted rim was also unusual (no. 130) in that the flange displayed a distinct swelling towards the edge to give a rounded effect. A rim sherd of a like, though not identical nature having a more rolled rim, was recovered from site 1 (no. 113), with a better parallel coming from Dun Mor Vaul, Tiree (Mackie 1974, fig. 18 no. 423). Two other out turned rim types were represented, sherd no. 133 had a thin out turned lip with traces of possible faint fingertip dimples in the lip angle, not unlike sherd nos. 107 and 108 from site 1, while sherd no. 135 had a thick out turned rim with a horizontal row of inclined fingernail stab marks just beneath. The one inturned rim, no. 129, had two fingertip marks in a row just below the rim, though these are so faint that they are perhaps best considered as being produced during the forming of the rim, rather than as deliberate decorative features, and hence the rim form can be compared with others from A Cheardach Bheag, S. Uist (Fairhurst 1971, fig. 7 no. 4 and 6).

The presence of two lines of stones crossing the wall of the hut indicated that the entrance to the structure probably lay in the north-western quadrant of site 3. This was confirmed by a note contained in a box of sherds describing a context as being in the north-eastern triangle of the quadrant and consisting of dark soil above and between stone to the east of the entrance. The pottery from this context totalled 120 sherds, of which one (no. 135)

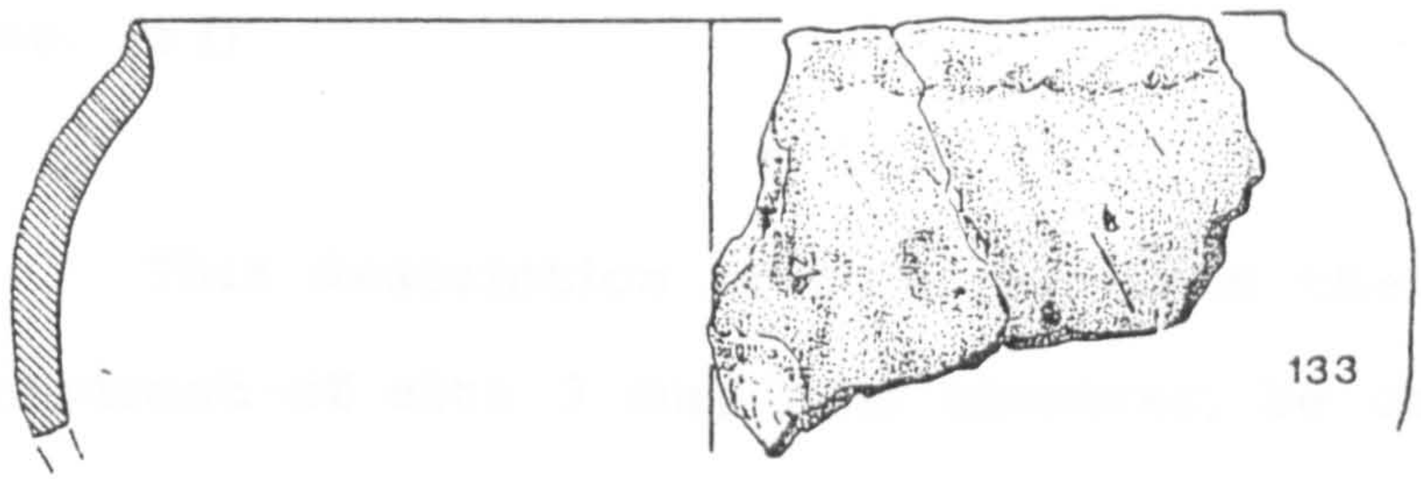
proved to be the basal angle of a flat bottomed vessel. Decorated sherds included one zigzag cordon (no. 138) and a sherd with a single incised line flanked by two impressed dots on either side (no. 136), this may once have formed part of a more general pattern, as for example at Tigh Talamhanta, Barra (Young 1953, fig. 8 no. 87). One of two sherds probably coming from the same vessel (no. 137) bore the impression of a grain seed, whilst sherd no. 139 demonstrated a thin plain rim. The remainder of the pottery consisted of plain body sherds which appear to have derived from several different vessels.

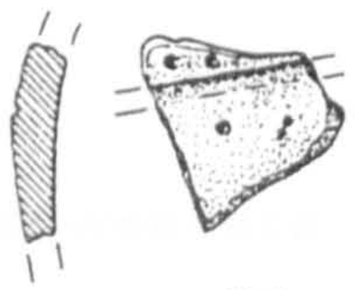
The pottery which was recovered from the 1959 excavation of the north-eastern quadrant of site 3 is recorded as coming from a floor level associated with bones and charcoal, this may equate with a floor level in the north-western quadrant which is described as being inside the face of the hut wall on a floor of the same level as the hearth. This layer produced two basal angle sherds (no. 141), probably from the same globular vessel, a body sherd with vertical striations on the interior (no. 142) and a collection of 49 undiagnostic plain wall sherds (no. 143). Another box of pottery, apparently recovered from '6" down' inside the dark soil of the floor level, held 19 sherds all from the same vessel (no. 144). The sherds have a black carboniferous deposit on the interior surface and may represent one of the earliest vessels from site 3, it is unfortunate that none can be made to match to produce the

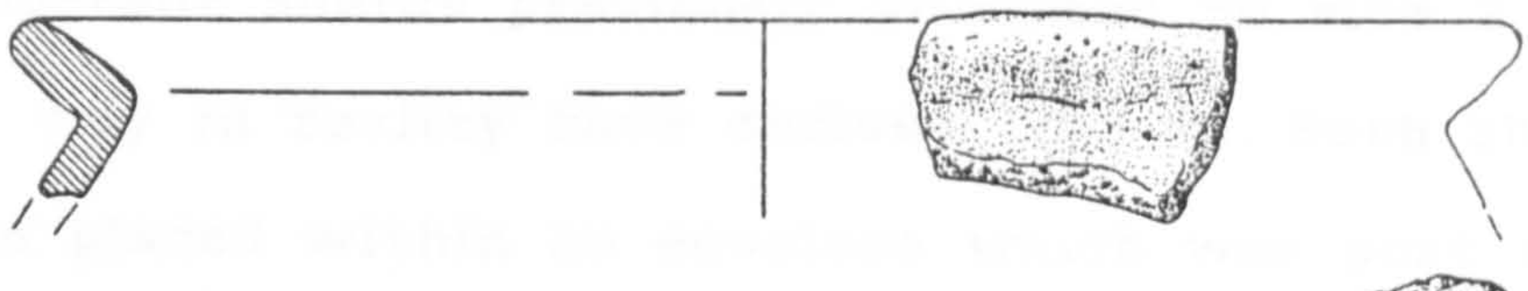
vessel's rim, foot or profile.

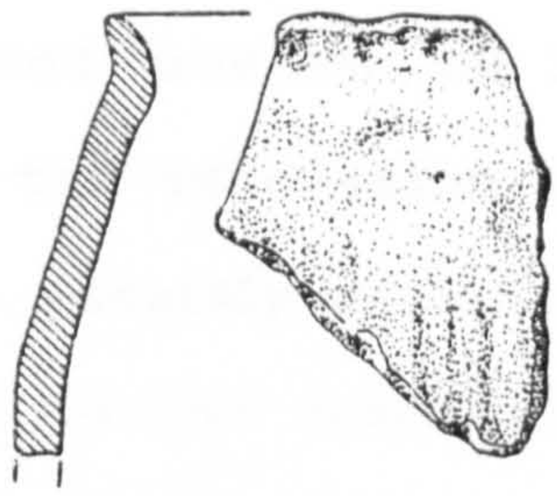
Site 3: the hut, South Western quadrant.

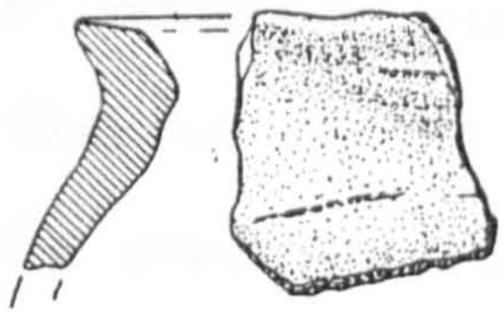
The south-western quadrant, the smallest of those excavated, produced two boxes of material, however, when refound in 1981, one of these was completely empty, whilst the other had two notes describing separate contexts from within the south-western quadrant inside it. Thus it is not known which of the total of 53 sherds came from the rubble of the outer part of the wall, and which came from a dark soil deposit inside the hut wall face. The quadrant as a whole produced two rim sherds with a thin out turned lip (nos. 145 and 146, two with an everted rim (nos. 147 and 148) of which no. 148 was very sharply everted, and one small sherd with a very crude out turned edge (no. 149). More notable was a domed base sherd which displayed two deep fingertip impressions in what would have been the middle of the bottom of the vessel (no. 150). Such a feature occurs on many sites throughout the Hebridean chain, such as Dun Mor Vaul, Tiree (Mackie 1974, fig. 11 no. 31 and fig. 19 no. 450), A Cheardach Mhor, S. Uist (Young and Richardson 1960, fig. 6 nos. 35 and 36), Bruthach A Sithean, Kilpheder, S. Uist (unpublished, NMAS, GS 79) and Dun Beag, Skye (unpublished, NMAS, GA 1114, IX-20-74 and 75). In addition the south-western quadrant produced 3 sherds with striations on their surfaces (no. 151), two sherds from the same vessel with black carboniferous deposits on the interior (no. 152)

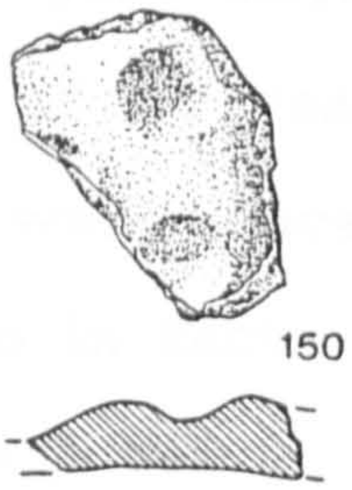


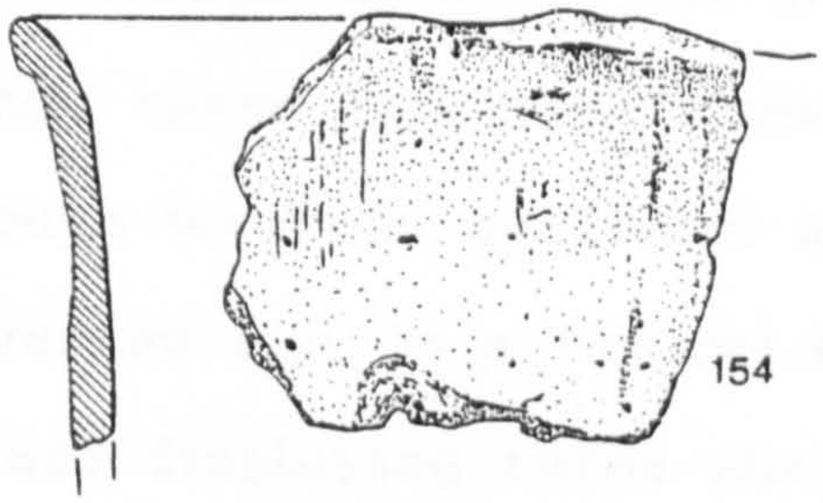


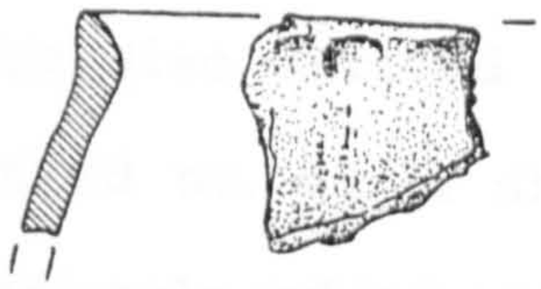


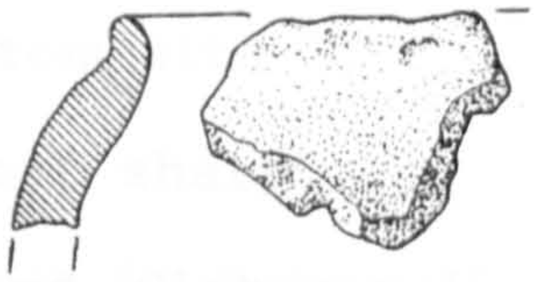


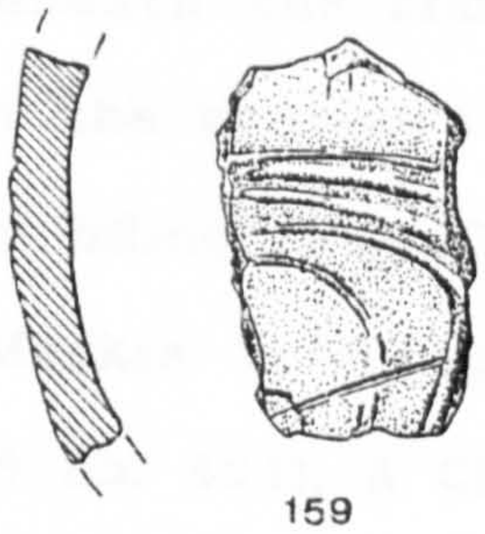


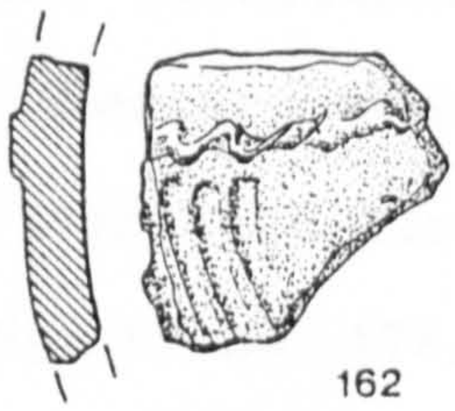


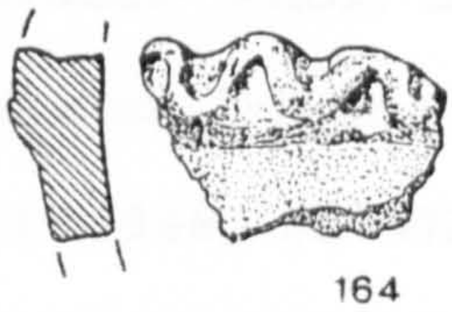


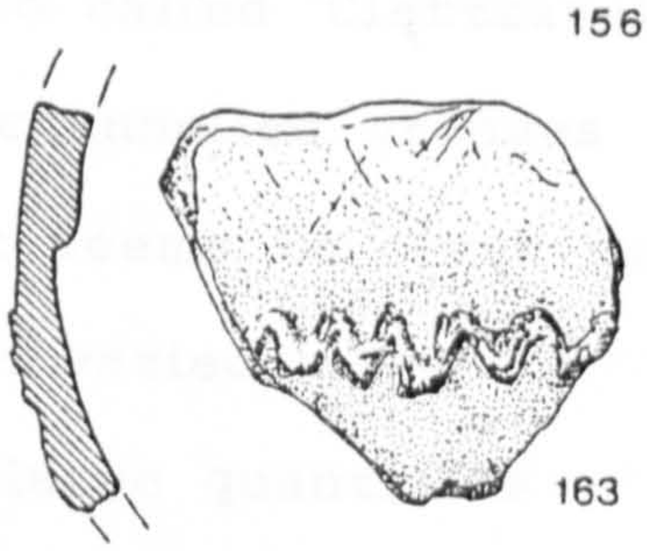












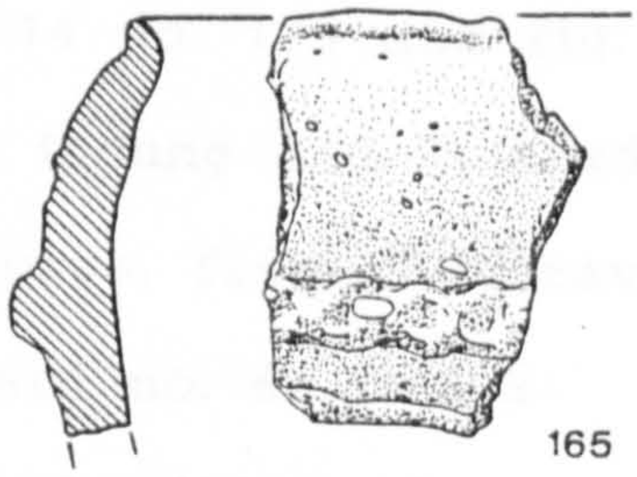


Fig. 30: Dun Cul Bhuirq pottery. Scale 1:2.

and a further collection of 42 sherds from different vessels (no. 153).

This description of material from the south-western quadrant of site 3 may not, however, be complete, because two important sherds previously allocated to site 2 (nos. 63 and 64), may in reality have derived from it. Both sherds had been placed within an envelope which was post marked 1965 and labelled 'DB 3 SW'. Whilst a minimum of six years after the excavation had elapsed before they were placed there, possibly causing some confusion, they do in fact relate to the description on the envelope. The notes associated with all the pottery refound in 1981 indicate that these two sherds were also derived from site 3, south-western quadrant. Sherd no. 63, a short sharply everted rim, is a typical example of so called 'Clettraval', ware displaying three shallow finger channelled grooves beneath the rim. This decorative trait seems to occur mainly in the southern of Western Islands, on varied sites including from Dun Mor Vaul, Tiree in large quantities (Mackie 1974, eg. fig. 13 no. 178, fig. 14 no. 179 and fig. 19 no. 453), A Cheardach Mhor, S. Uist (Young and Richardson 1960, fig. 6 nos. 30 and 31) and of course, from Clettraval, N. Uist itself (Scott 1948, Pl. VIII). Sherd no. 64 had a black, sooty interior and was decorated with a zigzag cordon.

Site 3: the hut, South Eastern quadrant.

The third of the quadrants which was also excavated in 1958 was overlying the south-eastern part of the hut on site 3. This quadrant included the southern circuit of the hut wall and in part also overlay the wall of the fort. The pottery which was excavated from below the 'turf and above and between stones' included 8 rim sherds of varying types. Two sherds exhibited out turned lips (nos. 155 and 156), one was also out turned and flaring (no. 154) with parallels at Dun Cuier, Barra (Young 1956, fig. 9 nos. 61-63) and the rest appeared to be flanges broken off from everted rims (nos. 157 and 158). Two other sherds (no. 159) had irregular grooved and incised curvilinear lines, which by dint of their depth could not be seen as having been randomly acquired during manufacture, but rather seemed to be deliberate decorative features, though of what larger general pattern was unclear. Sherd no. 160 was incised with a single line and may well have come from the same vessel. Zigzag cordons were found on three sherds (nos. 162-164) with no. 163 having traces of fingernail nicks in each of the up waves, it is very similar to a sherd from A Cheardach Bheag, S. Uist (Fairhurst 1971, fig. 8 no. 8). The cordon of sherd no. 165 was of a straight finger impressed type, with small grits also sticking to the surface of the vessel, the cordon could be paralleled at Dun Mor Vaul, Tiree (Mackie 1974, fig. 18 no. 384). A possible impression of a seed of large size, perhaps from a tree, and certainly of small

acorn shape, occurred on sherd no. 161. The remainder of the pottery from this context consisted of four sherds, one of which was heavily grass marked.

Another box of pottery, also from 'above and between' stones, though in this instance more specifically from the north-western triangle of the south-eastern quadrant, contained a further 62 sherds. These included a probable everted rim flange (no. 167) and three basal angle sherds (nos. 168-170) of which one (no. 170) was from a vessel with a domed bottom. Sherd no. 171 had a thick zigzag cordon and was lightly grass marked whilst the only other remarkable sherd (no. 172) had a carboniferous deposit on the interior and many surface striations on the exterior. Striations were also noted on a sherd from the south-eastern part of the quadrant, in a context on top of the fort, as opposed to the hut wall. A total of 35 other body sherds were further recovered from this latter context. The only other pottery definitely known to have come from this quadrant, consists of 6 sherds (no. 176) from the same vessel that had a very black sooty interior, and all of which were recovered from a rubble context inside the hut wall at the northern end of the rectangle. Other pottery refound in 1981 might also comes from site 3, although the contexts contained with the two boxes concerned are too vague for this to be stated categorically. One, containing 4 indeterminate sherds (no. 177) has a note describing them as being 'from below wall footing on south-eastern face (loose scree and grass below

1957 cut)'. The other box is enigmatically marked 'DB ?' and holds 4 grass marked sherds (nos. 178 and 179), probably from the same vessel, of which no. 178 displays a zigzag cordon.

Site 4: the platform.

Site 4, the small platform on the northern side of the fort which was excavated during 1959, is only known to have produced six sherds of pottery and two pieces of fired clay. One of the sherds, now missing, was a short out turned rim with a row of horizontal marks beneath the rim (no. 11); it came from the south-eastern cutting and though it cannot be confirmed, it appears to have been very similar to sherds nos. 107 and 108 from site 1. The rest of the site 4 material was located in the north-western cutting, and included two slightly footed basal angle sherds (no. 53), as well as 3 plain body sherds (no. 54), with the remainder of the assemblage consisting of two fragments of fired clay (no. 55) which were possibly yet more pieces of an oven or furnace capping. No structural remains were found on the site, although the limited nature of the trenches does not preclude that there was some settlement there.

Unknown contexts.

In addition to all the above pottery which can be related to excavated contexts, there does exist a small body

of material for which no such locations can be given. This includes a range of sherds recovered during initial work in 1957 (nos. 1-9), comprising two rim sherds, three base or probable base sherds, and a total of 19 body sherds. It is unfortunate that in common with parts of the assemblage from site 2, several of the potentially diagnostic sherds are now missing. Of what is extant, however, there is one very slightly inturned rim (no. 9) two base sherds which are both very heavily grass marked (no. 7) and a remainder of 18 wall sherds, most of which are small. Sherds from excavations in 1959, but from unknown site, amounted to a total of 1 everted, but now missing rim (no. 18), 4 fragments of fired clay (no. 13) and 16 body sherds of which one (no. 16) had an applied zigzag cordon with a sooty exterior. In the course of survey of the site in 1959, R.W. Feacham also found one everted (no. 83) and one out turned rim (no. 84), with other material coming, or supposedly coming from the site, being recovered by Rev. I. Renton (no. 85) and from Ludovic Mann (nos.79-82).

Chronology.

Few radio-carbon dates exist for pottery collections of this period in Western Scotland, and hence dating for many sites has in the past had to rely on parallels, both of vessel types and decoration. This situation also extends, for most sites, to many of the classes of associated artefacts which are found in conjunction with the pottery;

Dun Cul Bhuirg is no exception, and while broad guidelines may be suggested, no firm pottery chronology is either advanced or claimed. It seems particularly futile to argue dating from pottery types from other sites, if the dates themselves are derived from yet further sites where the chronology has been deduced from a starting point of poor stratigraphy or tenuous analogy of other artefact classes. Thus while guidelines have in the past been argued from the pottery of other sites, with many stylistic features having an apparently long sequence of development and usage, a chronology is best not constructed where there is a danger of circular argument.

Site 2 produced two glass beads, one during the 1959 cutting through the wall section and one during the 1968 extension. The former is of Mrs Guido's class 8, and was found in the first layer of the section, associated with sherds nos. 30-33. This yellow bead type has a wide geographical distribution, not just in Scotland, but in the British Isles as a whole, with examples coming from Cornwall to Shetland, and many sites inbetween (Guido 1978, 179-182). In other sites similar beads have been recovered from contexts of construction or early usage; at Dun Mor Vaul, Tiree, seven were recovered (Mackie 1974, 147-148), at Tigh Talamhanta, Barra, three examples were found (Young, 1953, 104) and at Dun Ardtreck, Skye, eight or nine were found on a necklace in the destruction levels. Generally dates from the 1st century BC to the 2nd century AD seem preferred for

this class of object, although some examples may date to the 3rd century BC (Ritchie and Lane 1981, 219). Another of these class 8 glass beads was found in the floor level of the north-eastern quadrant of site 3 in 1959.

The bead found during the 1968 extension of site 2 was of translucent glass, with yellow swirls, belonging to Mrs Guido's class 14 (1978, 87-9). Beads of this type are more closely restricted in their distribution to Scotland than are those of class 8, in association with which they are often found. Locations of the finding of class 14 beads include Dun Ardtreck, Skye, Dun Iardhard, Skye, Culbin Sands, Morayshire and Dun Mor Vaul, Tiree. Broadly similar dating with the later of the class 8 beads seems applicable.

Of the sherds, it might be thought that the ring pin stamped one would be the most valuable for dating the assemblage, since by its nature it must have been manufactured during a period when the particular type of pin was in use. The situation is complicated by the long period of usage of such pins, so that while ring pin stamping was once thought to be a decorative technique in use during the 2nd century AD (Young 1953, 104) and does occur at Dun Ardtreck, Skye in the dun interior in phase III (Mackie unpublished proofs, fig. 8 no. 31), where Roman coarse and samian wares occur in phase II/III contexts, it is now clear from the excavations at Dun Mor Vaul, that ring pin stamping was potentially applied to vessels prior to the middle of

the 1st millennium BC (MacKie 1974, 128).

An important consideration is obviously the type of the pin involved in the production of the decoration. Two distinct classes can be identified from the pins, namely shouldered ring headed pins and pins whose ring is movable, and while it was once thought that the latter was derived from the former (Young 1953, 94), this is no longer so certain (Fanning, 1983, 330); rather it would seem that the projecting ring shouldered pin evolved separately into the hand pin form. The ring pin stamped sherd from Eye, Lewis demonstrates that the decorative theme has a long lifespan, as the type of pin used in this particular case was not present in Scotland until the Viking period (Ibid, 331). The spiral ring head pin from phase IV at A Cheardach Mhor was dated to the 7th/8th centuries AD by the excavator (Young and Richardson 1960, 158) and given the evidence of similar types from Ireland this seems not unreasonable (Fanning, 1983, 325). Thus ring pin stamping, with heads of either type, can be seen to have been in use in the Western Isles over a period of a millennium. With this being the case, it is clear that the identification of the exact form of the pin is crucial and unfortunately due to the broken nature of the Dun Cul Bhuirg sherd this is not possible.

Several of the other decorated sherds also deserve some brief consideration, in particular some of those which belong to the collection of sherds from site 3 refound in

1981. One of the sherds has a deep fingertip impressions in the base (no. 150), this feature was noted at Dun Mor Vaul, Tiree. and also at Kilpheder, S. Uist (NMAS, unpublished, GS 79). The sherds from the wheelhouses probably have a date in the early centuries AD, though those from Dun Mor Vaul occurred in the pre-broch deposits and were dated to the perhaps as early as the fifth century BC. One other notable sherd was no. 124 which displayed a very thick heavy cordon which had been vertically slashed and then impressed with a round pointed object. There are no immediate parallels for this sherd, although the heaviness of the cordon is reminiscent of those found on several sherds from Balevullin, Tiree (Mackie 1964, fig. 4 nos. 58 and 59).

<u>NAA results.</u>

Ten sherds of pottery from Dun Cul Bhuirg were selected for neutron activation analysis. Sherds were chosen which possessed distinctive stylistic or decorative characteristics; the fact that several had already been examined by Mr G. Collins of the Institute of Geological Sciences was also taken into consideration. At the time of sampling for NAA only the extant sherds which were described by Ritchie and Lane (included in nos. 1-86) were available for drilling and for this reason the majority of samples which were taken were thought to be from site 2.

Three of the sampled sherds (nos. 16, 19 and 20) had

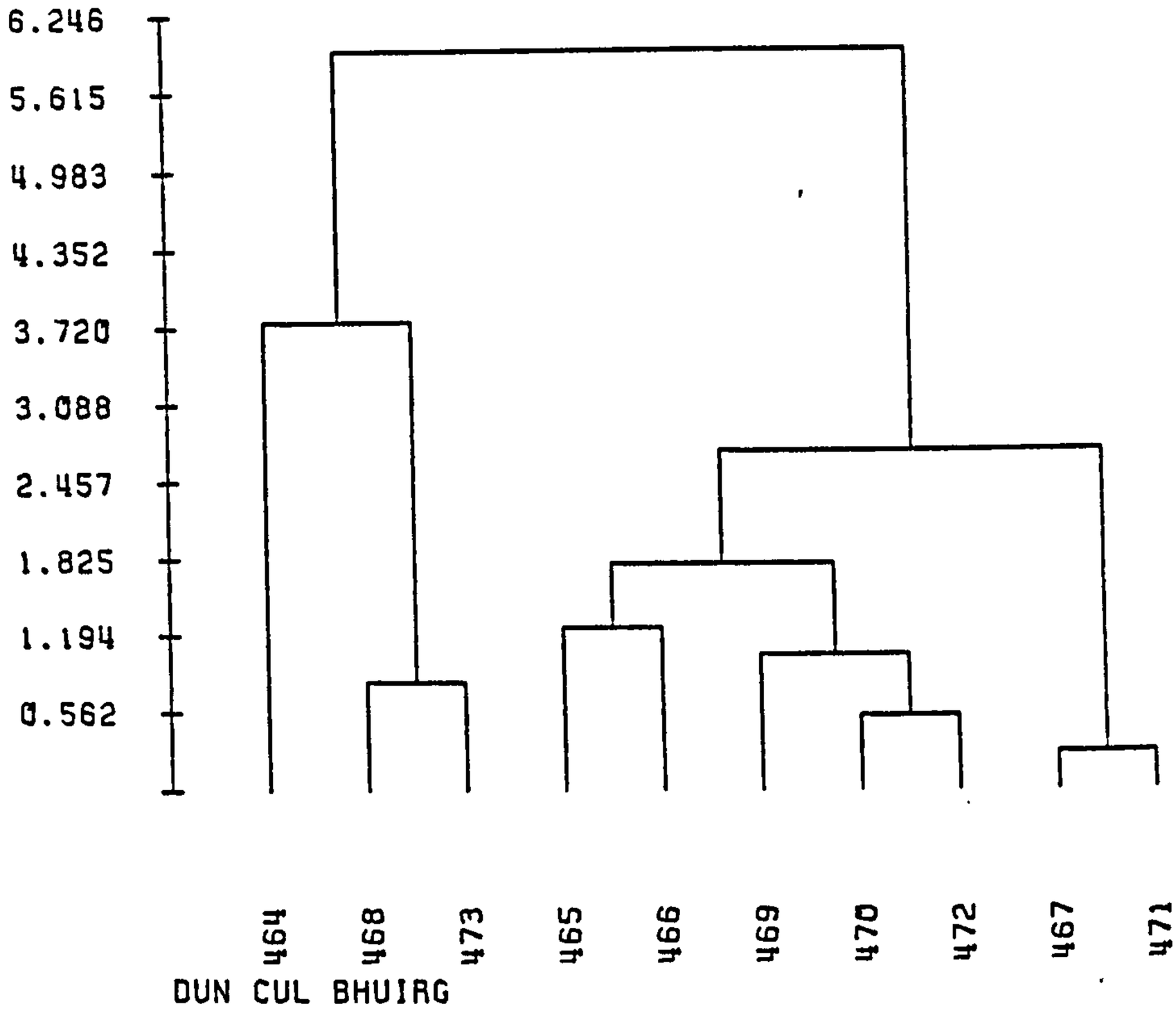


Fig. 31: Dendrogram of the sampled sherds from Dun Cul Bhuirg.

previously been examined by Mr G.H. Collins (1981, 224), who identified that all contained numerous fragments of granitic gneiss, as well as smaller amounts of hornblende crystals. Both granitic and hornblende gneiss occur in the Lewisian geology of Iona and hence it was suggested by him that the pottery was of local origin, though it was acknowledged that such a geological composition also occurs widely elsewhere. The results for all the sherds analysed are shown in Fig. 31 labelled by the NAA sample number and labelled by site and context in Fig. 32. Figs. 33 and 34 demonstrate that there are only three clusters which are significantly distinct in the dendrogram and the details of the members of the clusters are summarized in Figs. 35-37. As stated in chapter 2 the importance of the significantly different clusters is that they represent dissimilarity of chemical composition with others on the same dendrogram rather than homogeneity of vessel type or decoration within the cluster itself.

It is clear that no differentiation can be noted between the differing sites, decorative styles or rim types, and while, for example, sherds nos. 64 and 16 are most alike of all the sherds in the dendrogram they do not demonstrate features which can be defined on archaeological terms as different from the rest of the sampled sherds. What can be noted, however, is that each of the contexts from which the samples were drawn did not have a specific clay source or method of manufacture unique to that context, in terms of detection by NAA. It is unfortunate that the chronological

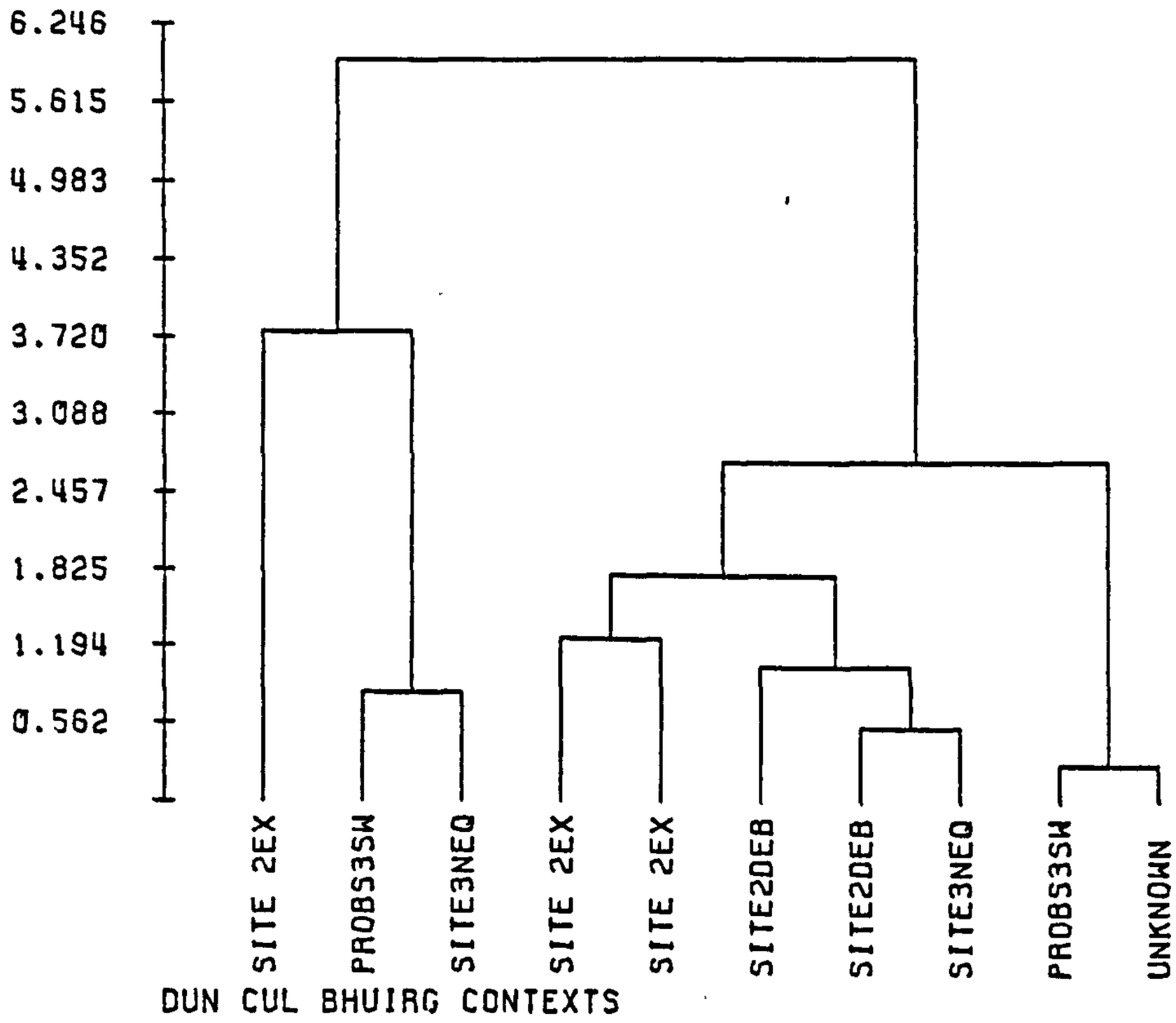


Fig. 32: Dendrogram of the sampled sherds from Dun Cul Bhuirg, labelled by site and by context.

Dun Cul Bhuirg

Cluster One: NAA samples 464, 468, 473.
Next closest grouping: NAA samples 465, 466, 469, 470, 472, 467 and 471.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	45.1	<0.0	2.5	19.8	23.7	52.7
Accept Null hypo.	Yes	No	No	Yes	Yes	Yes

Null hypothesis: Cluster One and the next nearest grouping come from the same population.

Fig. 33.

Dun Cul Bhuirg

Cluster Two: NAA samples 465, 466, 469, 470 and 472. Cluster Three: NAA samples 467 and 471.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	7.0	13.2	3.6	6.6	0.8	1.5
Accept Null hypo.	Yes	Yes	No	Yes	No	No

Null hypothesis: Cluster Two and Cluster Three come from the same population.

Fig. 34.

Dun Cul Bhuirg: Cluster number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
464	76	Site 2 ext.	-------	finger pressed cordon
468	63	Prob. site 3 SW quad	sharply everted	three finger channelled grooves
473	19	Site 3 NE quad	sharply everted	thick applied neck cordon with finger tip impressions on it

Fig. 35.

Dun Cul Bhuirg: Cluster number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
465	78	Site 2 ext.	out turned lip	impressed dots and grooved
466	77	Site 2 ext.	-------	two arcing impressions, prob. a ring headed pin
469	34	Site 2	sharply everted	----------
470	35	Site 2	-------	applied wavy cordon
472	20	Site 3 NW quad	-------	striated exterior

Fig. 36.

Dun Cul Bhuirg: Cluster number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
467	64	Prob. site 3 SW quad	-------	applied wavy cordon
471	16	Unknown	-------	applied wavy cordon

Fig. 37.

relationship between the two contexts, the fort wall of site 2 and the hut habitation of site 3, cannot be established through the stratigraphy, because then the preceeding statement could also have applied on a chronological as well as spatial dimension. The limiting factor in the case of the samples drawn from Dun Cul Bhuirg is that 10 is a statistically small number, although as will be indicated in later chapters the conclusions for Dun Cul Bhuirg are applicable to many of the Hebridean later prehistoric sites.

Chapter Four: Tiree.

'There are several Forts in the Isle; one in the middle of it, and Dun-Taelk in Baelly Petris: they are in form the same with those in the Northern Isles.' (Martin Martin 1716, 270).

Geological background.

Tiree and Coll are a pair of islands which, though forming part of the Inner Hebrides group, are situated to the west of the rest, and consequently lie in more open waters of the Atlantic. Tiree, the flatter and better suited to arable agriculture of the two, has long sandy beaches with extensive areas of low grass covered machair. It was mapped geologically in the early 1920's and has long been famed (Knox 1769, 73) for the occurrence of pink and grey marbles in the Scarinish and Balephetrish Bay areas. Tiree, as with the rest of the Hebridean chain, has a geological composition dominated by Lewisian gneisses. This complex of rocks comprises paragneisses which represent metamorphosed sediments, and orthogneisses, the greater part of which were produced by the metamorphism of plutonic igneus rocks (Phemister 1948, 7). On Tiree the metamorphosed sediments include garnetiferous biotite-gneiss, garnet-biotite-granulite and graphite-schist (Peach and Horne 1930, 68) as well as the marbles, which have been the subject of separate studies (Coomaraswamy 1903). The orthogneisses have three main components, grey biotite-hornblende-gneiss, black hornblende-schist and pale grey, pink or red granite gneiss.

Perhaps of greater significance for pottery production, is the band of glacial till which extends northwards from Hynish in the south-west of the island through the township of Balephuil (Bilby, Hudson and Henderson 1982, fig. 6). It is known to have been utilised for this purpose in recent times (Beveridge 1903, 70). Samples from this clay were analysed by both X-ray diffraction and NAA, the former indicated that the mineral composition included quartz, muscovite, chlorite, kaolinite, albite, potassium feldspar and tremolite. This composition, containing the kaolinite, would be characteristic of a good potting clay. The dendrogram in Fig. 13 (chapter 2) also demonstrates it to have been the most homogeneous of the Western Isles clays which was sampled.

Further samples which were taken from near the site of Dun Mor Vaul, on the northern coast of the island, were also analysed by both X-ray diffraction and NAA. It was not possible to locate an actual clay bed at the site, so samples were removed from a layer of black soil which it was thought might have a high clay content. The X-ray diffraction results indicated that the following minerals were present; quartz, albite, tremolite, chlorite, muscovite and montmorillonite.

Of especial interest are the minerals which are members of the sheet silicate group and in particular the clay sub

group. Of the latter, kaolinite is the most useful mineral in pottery production and is the major constituent of China clays. It is formed principally by the hydrothermal alteration or weathering of feldspars and other silicates.

Montmorillonite, another of the clay group, is largely produced by the weathering of basic igneus rocks and is notable for its high absorptive capacity of water; it is one of the major component minerals of Fuller's earth. It is for this reason, however, that it is not as prized as kaolinite in pottery production, because loss of water results in shrinkage and cracking. The muscovite is also potentially useful for potting, and although not a clay mineral, it is one of the sheet silicates, which when broken down during weathering can eventually form kaolinite.

Both of the sample sites produced X-ray diffraction results indicating the presence of quartz, this is not unusual as quartz is one of the most common of minerals, occurring in igneus, metamorphic and sedimentary rocks. It is well known for its resistance to physical and chemical corrosion and thus its presence in both samples is not remarkable. It is of interest that both sets of samples from the two sites contained tremolite as this is essentially a metamorphic mineral which occurs in both contact and regionally metamorphosed rocks (Deer, Howie and Zussman, 1980, 165). Albite, which is a sodium feldspar, and the potassium feldspar itself, are both constituents of the general alkali feldspar group which occurs in association

with volcanic and plutonic rocks (Ibid, 285-317). The sample from Balephuil also contained chlorite, which is a sheet silicate that commonly occurs in the alteration of biotite and other minerals in igneus rocks and also in regionally metamorphosed basic igneus rocks. Thus the geological chemistry of the samples which were analysed is not incompatible with the geological background of the island itself, although the parent origin of the glacial till is open to question.

History of archaeological investigation

The existence of archaeological structures on the island was noted by Martin Martin, who drew a parallel between the forts he observed and those of the Northern Isles (1716, 270). The island received little serious attention, however, until the survey conducted by Erskine Beveridge between 1896 and 1901 (1903). As was indicated in the published title, this work also considered the island of Coll, and was directed towards those monuments which appeared prehistoric or early Christian. During the course of his work Beveridge found prehistoric sherds of pottery from within, or close to several of the small stone forts and though while these appear as photographs in his account, no precise contexts or find spots are recorded. This is unfortunate, because of the several plates of pottery, many can be shown to have similarities to sherds from more precise contexts on the island, in particular plate 9 has a

close parallel to pottery from the Iota contexts at Dun Mor Vaul. The earliest excavation of later prehistoric structures was undertaken by A.H. Bishop and L.M. Mann at Balevullin (MacKie 1963) and Cornaig (Mann 1906) in the western part of island. Both sites appear to have been later prehistoric hut occupation floors, though Balevullin in particular also produced a range of unusual, and perhaps early, pottery decoration and styles. These, and the recording of a souterrain (Goudie 1917) and a Viking burial (Shetelig 1940) were the only notable excavations or finds until the work which was commenced by Dr. Euan Mackie at Dun Mor Vaul in 1962 (Mackie 1965; 1974). The site which was excavated over a period of three seasons, was the most impressive of the small forts on the island and displayed what MacKie considered to be the largest number of broch like features. Its importance lies not just in being the only broch to be substantially excavated in the Western Isles in recent times, but also in existence of a pre-broch structure and in the quantity of pottery and other artefacts associated with most levels throughout the site's period of occupation. For these reasons Dun Mor Vaul will be the first site which will be discussed.

<u>Summary of the excavation of Dun Mor Vaul.</u>

The isolated rocky knoll upon which the broch was built, lies on the western side of Vaul Bay and was utilised as an occupation site from the before the mid first

millennium BC. The first structure on the site (phase 1A) was a hut (Fig. 38), probably of wattle and daub construction, and although only partially excavated it was shown to have a floor level and an associated midden, both containing sherds of pottery and artefacts of bone and stone. In phase 1B these early deposits were overlain by a 'buttery' midden which extended below the later broch walls and contained sherds and animal bones from which a C^{14} date of 280 ± 100 bc was derived.

Following a period of abandonment, the knoll was reoccupied for the construction of the broch (phase 2), dated to ad 60 ± 90 by a C^{14} date from construction deposits. The main entrance, with a guard cell to the right, faced east, and a mural gallery with a cess pit and three doors to the interior contained a stairway with 11 remaining steps. Phase 3A was the period of the initial use of the broch, and although a thick floor deposit was excavated, no hearth was found. A raised wooden floor supported by the scarcement and by a ring of posts probably existed during this phase at a height of 6' above ground level (Mackie 1974, 6). This raised floor was thought to have been removed during phase 3B, when a paved and kerbed hearth was constructed on the floor of the broch. While it was believed that the broch remained largely as a defended structure in this phase, it was postulated that the layer of wind blown earth in the outer court, to the north of the broch, represented a use of the land immediately around the knoll

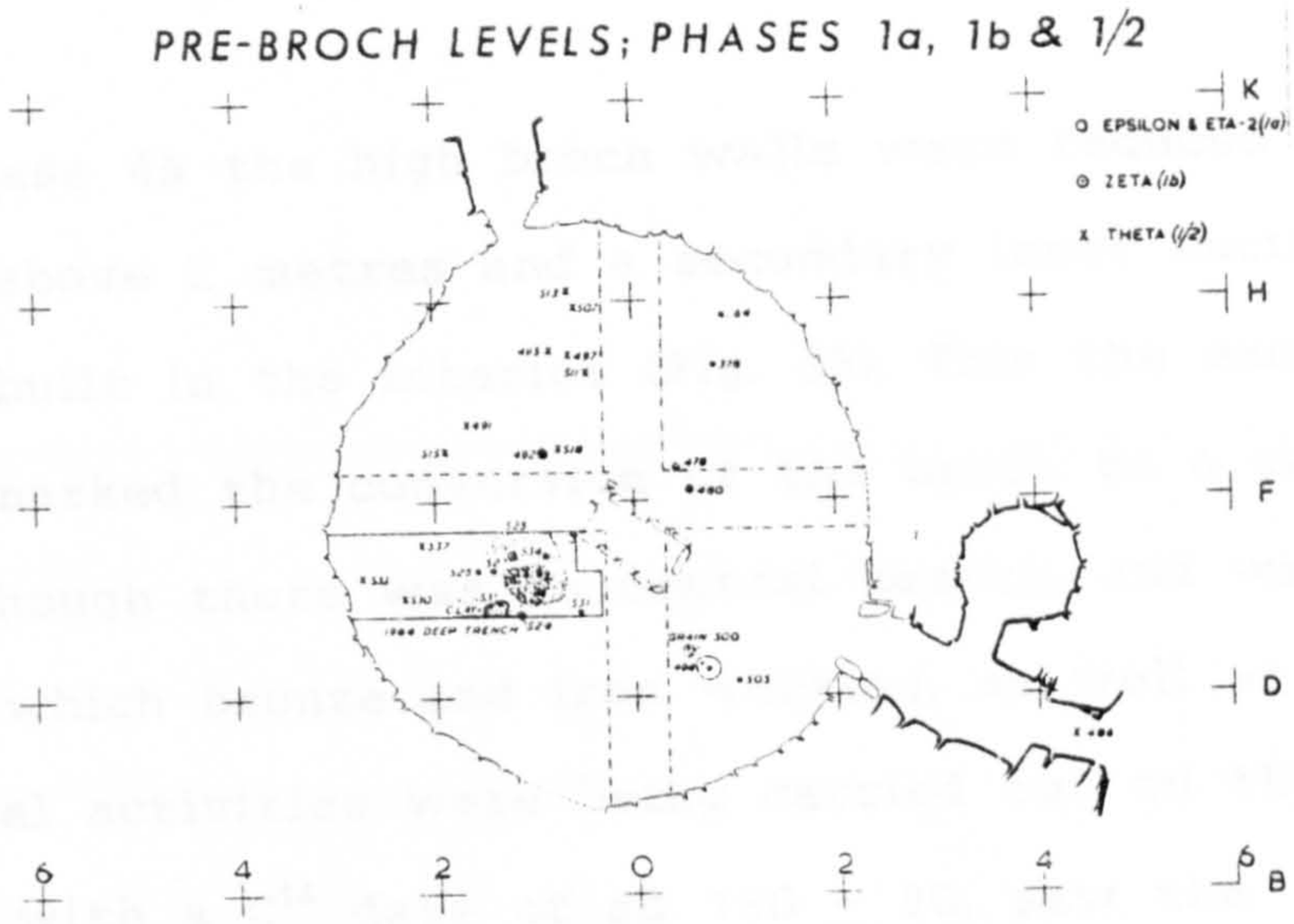

PRE-BROCH LEVELS; PHASES 1a, 1b & 1/2
K
EPSILON & ETA-2(1a)
ZETA (1b)
THETA (1/2)
H
F
D
1966 DEEP TRENCH S2W
DRAIN 300
6
4
2
0
2
4
6
B

Fig. 38.

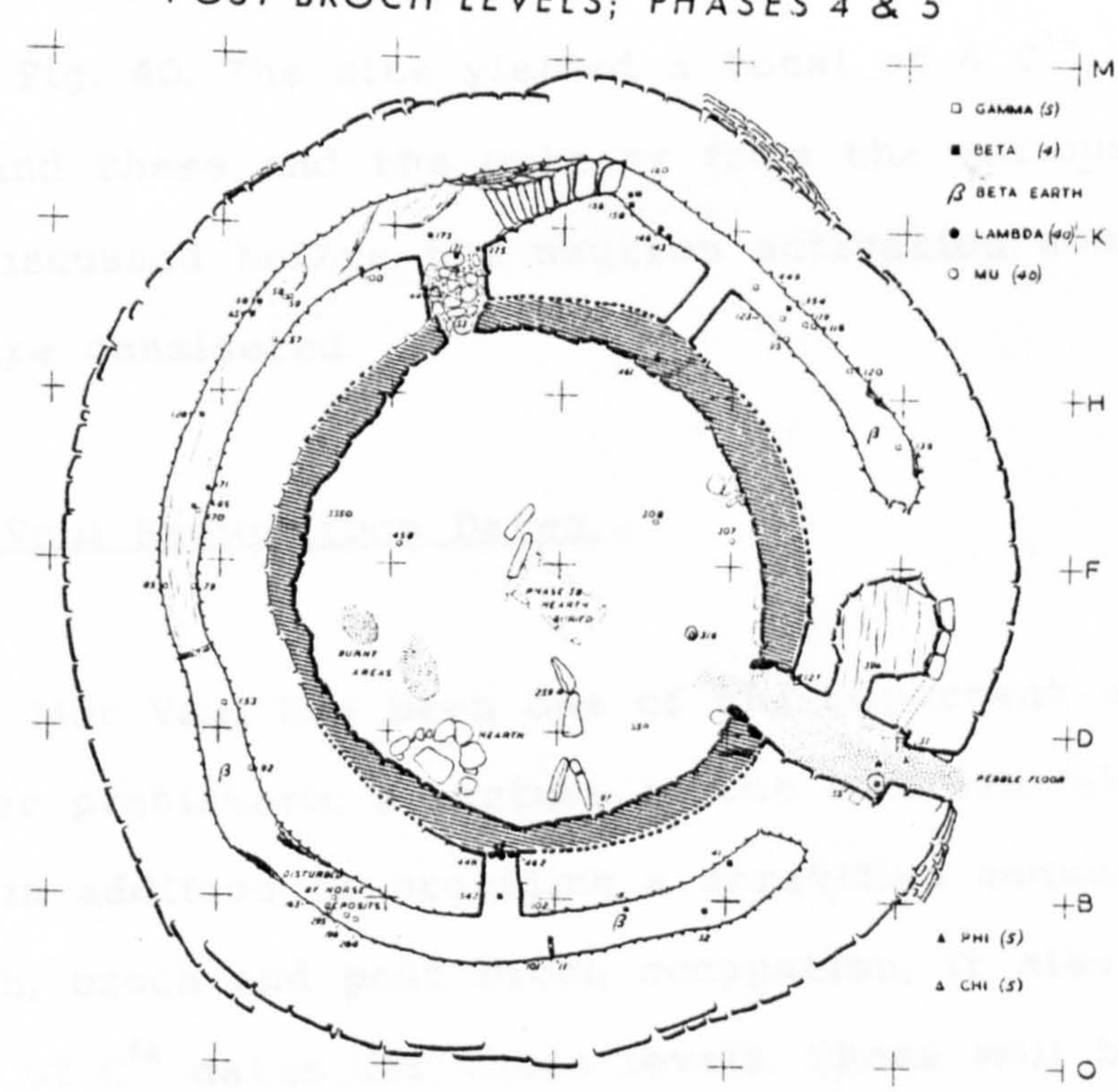

POST BROCH LEVELS; PHASES 4 & 5
M
GAMMA (5)
BETA (4)
BETA EARTH
LAMBDA (40)
MU (40)
K
H
F
D
B
PHASE 5B HEARTH REMOVED
BURNT AREAS
HEARTH
PEBBLE FLOOR
PHI (5)
CHI (5)
O

Fig. 39.

for agricultural activity.

In phase 4A the high broch walls were reduced to levels not much above 2 metres and a secondary inner encircling wall was built in the interior (Fig. 39). This the excavator believed, marked the conversion of the broch to a round farm house, although there was no central hearth, and was a period in which bronze and iron working, as well as agricultural activities were being carried out on the site. Phase 4B, with a C^{14} date of ad 160 $\pm$ 90, saw the delapidation of the broch, with the galleries being infilled with rubbish and the final phase, phase 5 was one of sporadic occupation, perhaps continuing into the 8th century AD. The stratigraphic relationships between the phases is shown in Fig. 40. The site yielded a total of 8 C^{14} samples and these and the pottery from the various contexts will be discussed before the neutron activation analysis results are considered.

Dun Mor Vaul Radiocarbon Dates.

Dun Mor Vaul has been one of the important excavations of a later prehistoric structure in the Western Islands, because in addition to providing a stratified sequence of pre broch, broch and post broch occupation, it also provided a series of C^{14} dates for these levels. These will be discussed in some depth below. The dates and the samples from which they were derived were examined in some detail by

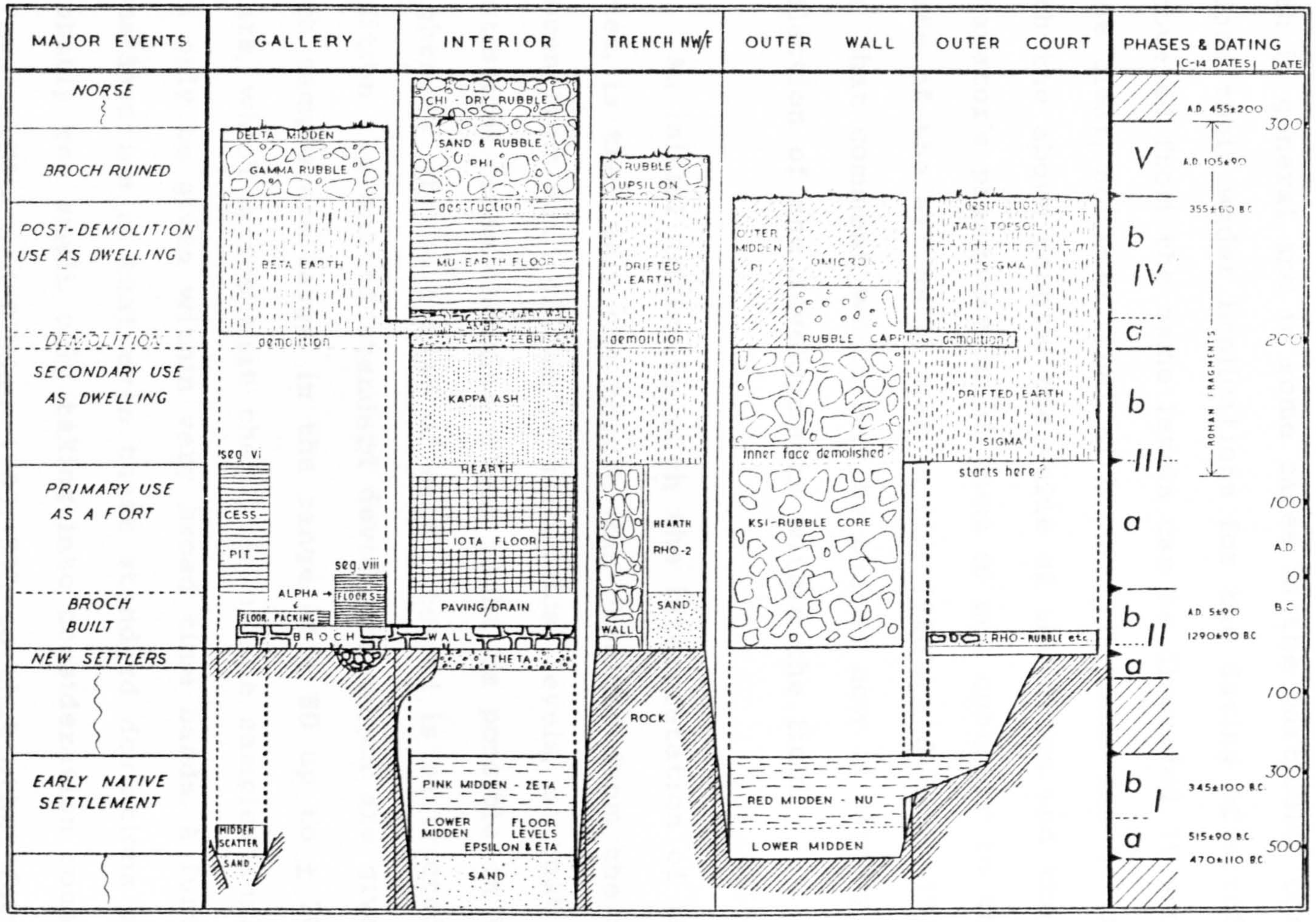


Fig. 40: The stratigraphic relationship of contexts at Dun Mor Vaul (after Mackie 1974).

the excavator (Mackie 1974, 228-231) and were used by him to support the differentiation of the periods of the site's usage which had originally been indicated by the stratigraphy. The precision and accuracy of the C^{14} dates and the excavator's use of them requires examination, both in general and in some cases in the particular context, before their wider implications for the dating of artefacts recovered from the same levels can be discussed. It must be made clear, however, that although criticisms can be made on both the above counts, the value of the dates and the excavator's presentation of them is not contrary to the state of the art as it was in the 1960's and early 1970's, and that comment which may be passed now is largely a reflection of the developments within the field.

An initial difficulty with the interpretation of the dates, is that only one result was obtained from the samples chosen from each of the archaeological levels, so that any statistical cross checking which might be possible on the 'tightness' of the spread of each interval is restricted. In addition the quoted standard deviations which are given for each sample are large, in the range of $\pm$ 80 up to $\pm$ 200 years, which means that the dates of the samples analysed can only be given within very broad time bands. A further consideration is that even these standard deviations are probably too small, only taking into consideration counting errors (Baillie and Pilcher 1983, 51), so that other factors which affect the accuracy of a date, such as laboratory

bias, would increase the boundaries within which the date ultimately lies. The final problem which applies to the dates, and of course to any C^{14} date, is the matter of calibration from years bc and ad to real years. On the whole this has been a case of matching C^{14} dates from wood samples, to dendrochronological years derived from the from tree rings, with subsequent production of calibration curves (eg. Clark 1975, Klein et al. 1982). The original calibration of the Dun Mor Vaul dates is vastly over simplified, giving impossibly precise dates for each of the samples; they are illustrated in Fig. 41 as uncalibrated dates in years bc and ad at the one sigma confidence level. It was also unfortunate that the statistical procedures which the excavator followed (Ralph et al. 1973) were founded on incorrect statistics (Clark, 1975, 257).

The samples which were taken from the various levels from within the site have been recalibrated according to tables published by Klein et al. (1982), in Fig. 42. The date spans from which the C^{14} dates could have been derived are calculated at two standard deviations, ie. there is a 95% probability that each of the dates lies within the real years bracket, BC or AD which is quoted. These are illustrated in the lower part of Fig. 42 which perhaps gives a better impression of the degree of overlap which statistically exists between any two or more of the dates. The tables offered by Klein et al. were used as they were believed to provide one of the better calibrations

Dun Mor Vaul C-14 samples with real years
as given by MacKie (1974, 228-231).

No.	Context	Phase	Material	Date bp	Real Years
1	Epsilon 2	Early 1A	Roots	2350 ± 110	440-460 BC
2	Eta 2	1A	Grain	2395 ± 90	495-640 BC
3	Nu 2	1B	Bone	2230 ± 100	405 BC
4	Alpha 4	2B	Charcoal	3145 ± 90	1500 BC
5	Alpha 2	2B	Charcoal	1890 ± 90	AD 80
6	Tau	End of 4	Charcoal	2240 ± 80	410 BC
7	Gamma 6	5	Charcoal	1790 ± 90	AD 165
8	Gamma 2	5 Norse	Jawbone	1460 ± 200	AD 540
9	Phi	5 Norse	Human bone	1145 ± 155	AD 790-840

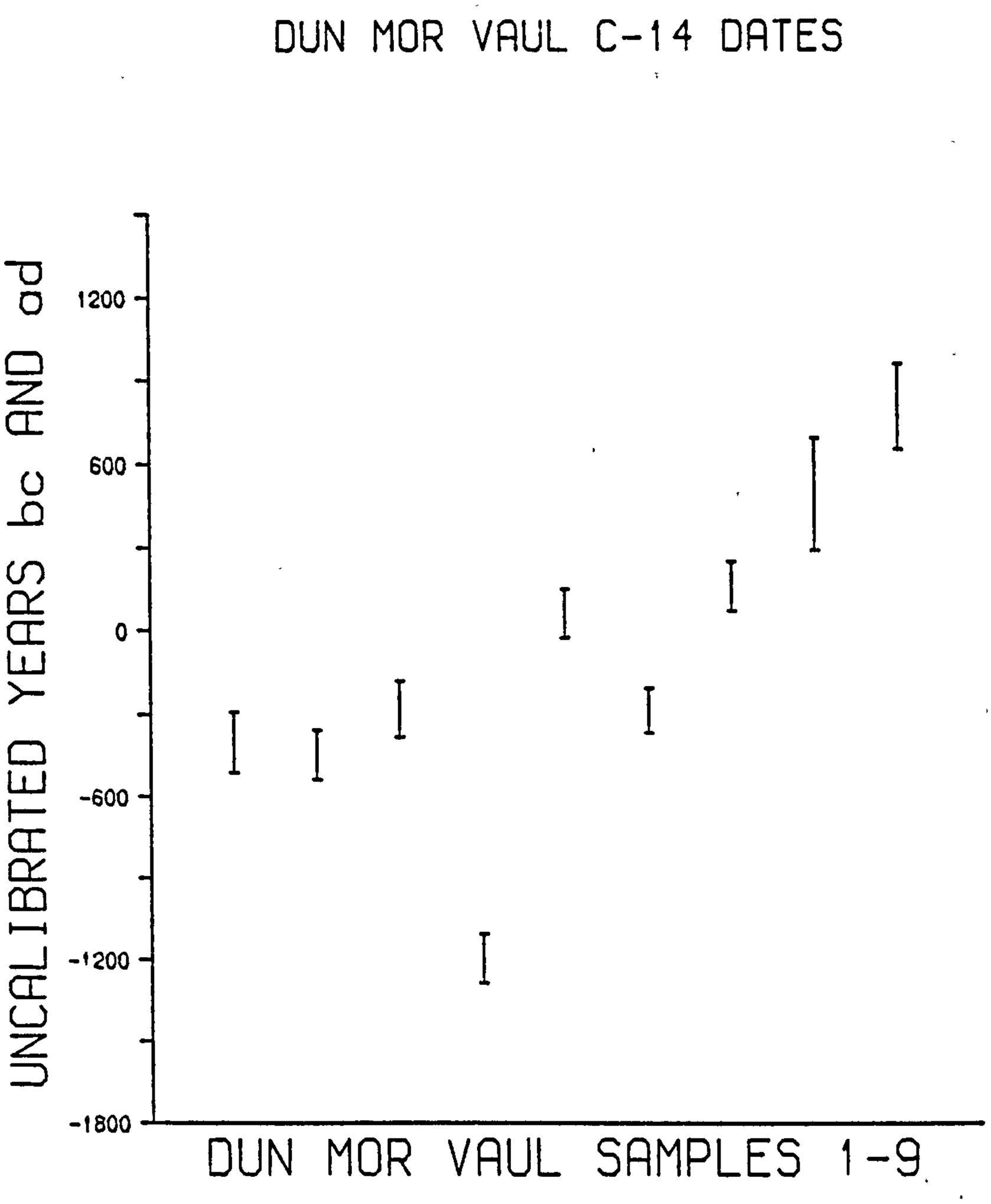


Fig. 41.

(Harkness, 1983, 26), although the accuracy of any of the existing tables is still a matter of concern for the 'flat' part of the curve in the period 400-800 BC (Baillie and Pilcher, 1983, 58-60).

Fig. 42 demonstrates that apart from sample 4 from Dun Mor Vaul, all the other C^{14} dates can be seen to overlap with at least one other, the implication is that any which do overlap can in fact have come from a sample of the same real age. Sample 4 was rejected as an outlier by the excavator as having been derived from peat charcoal, and thus being too old for the broch construction context in which it occurred; this does not seem an unreasonable conclusion. The first comment which may be passed on the rest of the dates is that the recalibration gives them all a much wider real year equivalent than was originally perceived; this has the effect of both removing the difficulty which was experienced by MacKie in the explanation of some samples and of lessening the value of others in the accurate definition of the site's periods of usage and change of function.

The pre broch occupation can be dated by samples 1-3, thus the first hut on the site (phase 1A) seems to have been occupied at some stage between the 8th and early 2nd centuries BC. The date associated with sample 2, however, may have a wider chronological spread than even that allowed for in the Klein et al. calibration tables, owing to its

Dun Mor Vaul C-14 samples with real years calibrated according to Klein (1982).

No.	Context	Phase	Material	Date bp	Real Years
1	Epsilon 2	Early 1A	Roots	2350 ± 110	770-180 BC
2	Eta 2	1A	Grain	2395 ± 90	785-215 BC
3	Nu 2	1B	Bone	2230 ± 100	555-25 BC
4	Alpha 4	2B	Charcoal	3145 ± 90	1680-1130 BC
5	Alpha 2	2B	Charcoal	1890 ± 90	155 BC-AD 255
6	Tau	End of 4	Charcoal	2240 ± 80	565-30 BC
7	Gamma 6	5	Charcoal	1790 ± 90	AD 10-430
8	Gamma 2	5 Norse	Jawbone	1460 ± 200	AD 225-890
9	Phi	5 Norse	Human bone	1145 ± 155	AD 605-1185

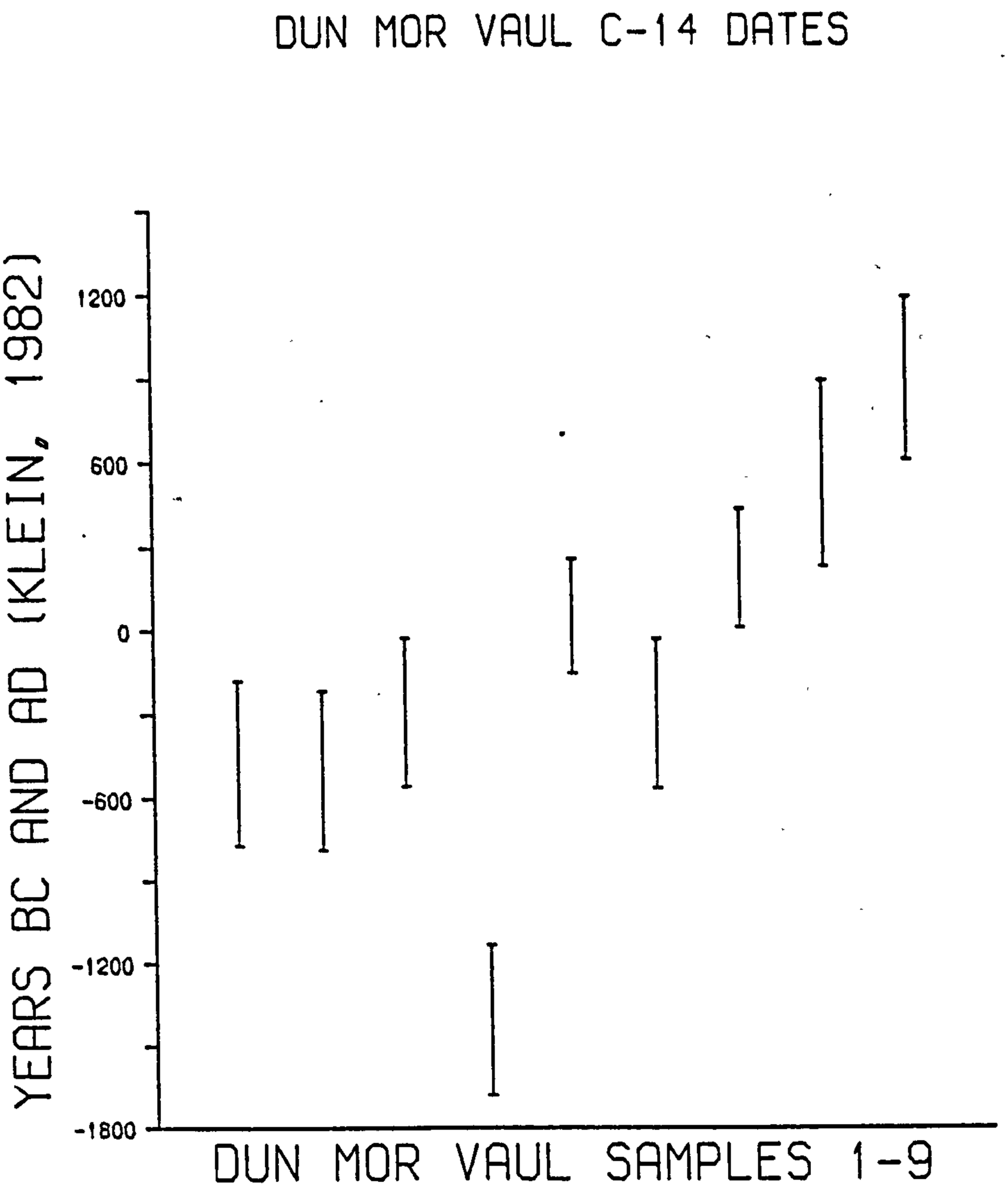


Fig. 42.

being derived from charred grain. The grain presumably coming from a single year's crop does not give the date added reliability, as the excavator thought (Mackie 1974, 229), but rather owing to the 'sunspot effect' the error associated with the date should be increased (Clark, 1975, 257). The second phase of occupation in 1B potentially occurred very soon after the first, from the mid sixth, although, indeed perhaps not until the early 1st century BC. The sample from context Alpha 2 ought to date the early period of usage of the broch itself, and this can be seen to be between the mid 2nd century BC and the mid 3rd century AD, comfortably in the period in which brochs are traditionally thought to have been built in the Western Islands. This date is also supported by the Roman glassware of the period AD 160-250 from the Iota deposits in the broch interior and by the finding of whole or parts of 3 small yellow vitreous paste beads.

The date from sample 6, context Tau in the broch outer court phase 4B, was considered anomalous by Mackie, because under his calibration it represented an age of 410 BC. Under recalibration its span is extended to 565-30 BC, which is still inconsistent with the date ascribed to the broch for phase 4B as based on the finding of Roman material in other contexts. It may be that it was from old charcoal, although as he stated there was no evidence for this (Mackie 1974, 230), or that it is a statistical outlier, one of the 1 in 20 dates which probability indicates lie outside 2 standard

deviations, but it could also be that Tau is not in entirety a phase 4B context. The context in fact relates to no well stratified layer or structure, but rather represents what appears to be an arbitary division of the first 6" of topsoil from the court, and although it contains no obviously identifiable early artefacts, on this as on any excavation, it would not be surprising if such a context did contain material from widely differing chronological horizons.

The recalibration of the C^{14} dates does, however, provide some light on problems which the excavator believed to exist. Date 7, from context Gamma 6, was obtained from charcoal in a rubble occupation layer and was originally believed to be too early by Mackie, as it was clear from the Roman material that the site was probably used after the 2nd century AD. After recalibration, however, this date has a span from AD 10-430 and thus the problem no longer exists. Similarly the date of AD 540 for the bovine lower jaw associated with a Norse bone comb, in context Gamma 2, also seemed too early; from Fig. 42 it can be seen that this could in fact date to any time between the early 3rd and the late 9th century, so this anomaly also need no longer exist. The final C^{14} date was for a burial in the rubble in the centre of the broch (context Phi) and this can be seen to be confirmed as early mediaeval).

The implications of the C^{14} date recalibration for

the pottery from the site apply mainly to the material from the early contexts. The effect can be seen to widen greatly the chronological span in which the hut sites in particular, were occupied; no longer can they be envisaged as probably of fifth century BC date. The new dates demonstrate the possibility of ring pin stamping and everted rim ware existing in the 8th century, this is potentially much earlier than previously envisaged. It also indicates the possibility that the current later prehistoric chronology for pottery and associated structures is too compressed. However, some caution is perhaps advisable given the mixed nature of many of the deposits, occurring both in antiquity and perhaps during excavation (Mackie 1974, 45 and in particular 130).

Pre broch pottery: contexts Epsilon 1-3, Nu 1-2, Eta 1 and Zeta.

The site of Dun Mor Vaul underwent five major phases of occupation and usage, with several associated sub-phases. The first activity on the site in phase 1A is represented by contexts Epsilon 1-3 and Eta 1. The earliest habitation from context epsilon, the floor of a wooden hut, was uncovered at the bottom of a trench which was sunk into the south-western quadrant. The pottery (Fig. 43) from the hut floor (Epsilon 1) included sherds from a large bucket-shaped urn with an inward curving rim (no. 34) with others bearing geometric incised decoration (eg. nos. 36, 39, 41 and 42). One sherd

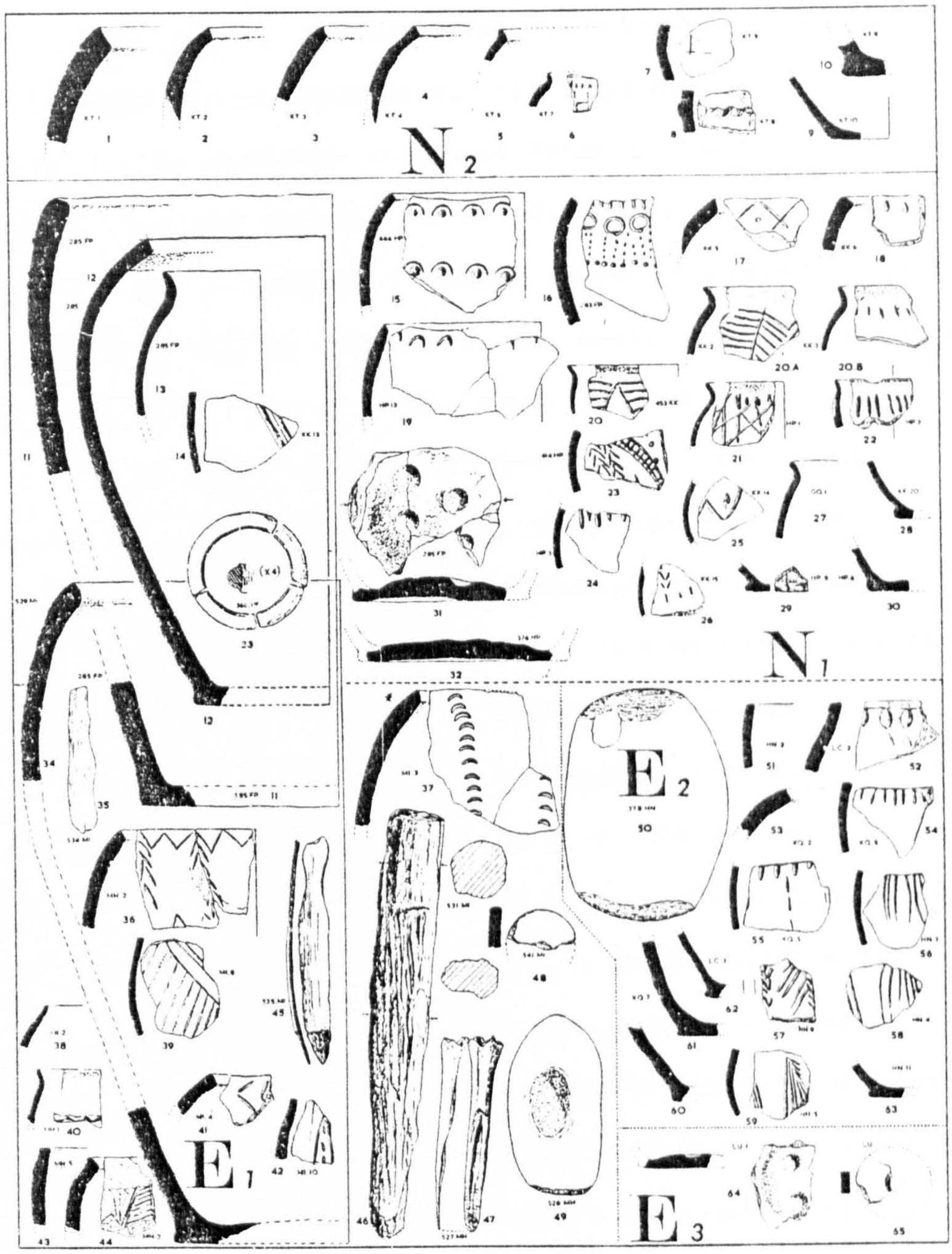


Fig. 43: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

(no. 40) had an out turned rim with an applied cordon worked into a slightly zigzag pattern. The bucket-shaped urn is of a type thought to be foreign to the Hebrides, though occurring on the Scottish mainland from contexts of the 7 th century BC onwards (Mackie 1974, 57) where it is known as Dunagoil ware. The Epsilon 2 sherds were recovered from a deposit of dark sticky midden in the north-east quadrant of the broch interior and included more incised decoration (nos. 54-59), several sherds with projecting bases (nos. 61-63) and one sherd with a slightly folded over rim and a row of fingertip impressions just beneath. An important omission in MacKie's site catalogue is the epsilon 2 everted rim (MacKie 1974, 38). It is not illustrated by him and although he may have preferred to dismiss its significance that surely ought to have been left to the reader to decide. Epsilon 3, a context under the old land surface, contained part of a spindle whorl (no. 65) and a base sherd with fingertip impressed decoration on the bottom of the interior. In phase 1A the Epsilon contexts have no dateable artefacts, other than the pottery, which might be used to date the early wooden hut. A C^{14} date was, however, obtained from preserved roots on the old ground surface at the base of the primary midden (Epsilon 2) and this has been discussed above.

The other phase 1A context was Eta 1 (Fig. 44), which was a black old floor level in the south-eastern quadrant of the broch interior lying on top of Epsilon 3. It was

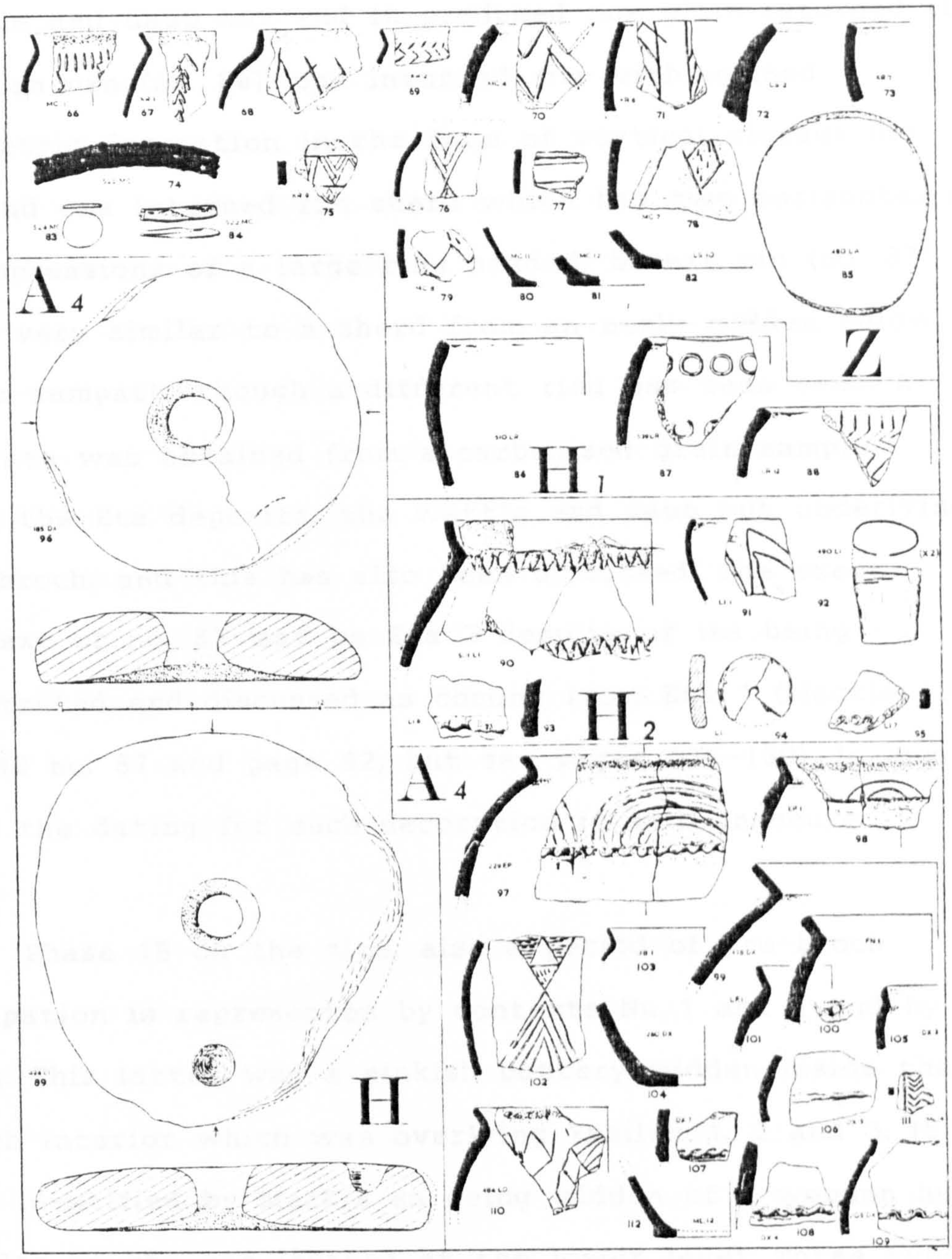


Fig. 44: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

ascribed by the excavator as being the floor level of a wattle and daub hut and it produced one plain inturned rim from an urn (no. 86), one inturned rim with incised geometric decoration in the form of vertical zigzags (no. 88) and one inturned rim sherd which has two horizontal rows of impressions of a large ring headed, bronze pin (no. 87). It is very similar to a sherd from an early midden below the outer rampart, though a different ring has been used. A C^{14} date was obtained from a carbonised grain sample from the Eta deposits, the wattle and daub hut underlying the broch, and this has also been discussed. The exact context of no. 87 may be Eta 2 despite of its being illustrated and discussed as coming from Eta 1 (Mackie 1974, fig 12 no. 87 and page 92, but see pages 129-130). In any case the dating for such decoration is still insecure.

Phase 1B on the site, also a period of pre-broch occupation is represented by contexts Nu 1 and 2 and by Zeta. This latter was a pinkish buttery midden inside the broch interior which was overlying Epsilon 1, 2 and 3. It was identified by MacKie as being midden of a wooden hut, similar to the one located at the lower level. Three types of pottery were recovered; small thin vases with slightly everted lips and footed bases (nos. 66-69), barrel shaped urns with inturning rims (nos. 70-73), and thick, rough sherds from barrel and bucket-shaped vessels, of which one (no. 74) was similar to a broken bucket urn in the midden of the same period in context Nu 1. Several of the sherds bore

incised geometric decoration (nos. 66-71, 75-79) which was of a type similar to the earlier Epsilon contexts.

Context Nu 2 was an occupation lying directly on the old turf line under the wall core of the outer rampart, on the north-eastern side of the knoll. The sherds were predominantly from thick, gritty barrel shaped urns whose rims were inturning (nos. 1-4), though in addition there were two finer rims, one of which had an upturned lip (no. 5) and the other a slightly out turned rim and bearing stab impressions and incised decoration (no. 6). Other recovered sherds included two parts of bases, one of which was from a thick barrel shaped urn (no. 10) and a sherd with a cordon which had either been impressed with finger nails, or some small sharp object, perhaps part of a small bone (no. 8).

Lying above this old turf line was Nu 1, which was a red midden level associated with an occupation phase before the broch was built. Parts of barrel and bucket-shaped urns (Fig. 43) were recovered (nos. 11 and 12), although rim sherds were also found which came from from smaller vases with thin slightly everted lips (eg. nos. 20, 20 A, 20 B, 21 and 22). A variety of decorative features is noticeable, the usual geometric incised or stabbed decoration (nos. 17-18, 20-26) with in addition finger channelling (no. 14) as well as two sherds which had been impressed or stabbed with circular or oval shaped objects (nos. 15 and 19). The former of these was similar in decorative type to one sherd from

Eta 1 (no. 87) which had two horizontal rows of impressions made by a ring headed pin. Of the sherds from Nu 2, no. 19 may have had its impressions formed by an oval ring headed pin tilted against the side of the vessel, whilst those on no. 16 were definitely made by a circular pin and occurred in association with stab marks and impressed dots. Of the base sherds recovered, one had a finger tip notched, footed base (no. 29) whilst another footed base had the remains of four and probably originally five finger tip impressions in the interior.

The other pre broch deposits were in phase 1B and include contexts Nu 1-2 and Zeta. Of the Nu layers only Nu 1 produced artefacts other than pottery and bone. Amongst the pottery were a further two sherds with ring pin stamps (nos. 15-16). One of the other finds was a circular bronze finger ring with a 'D' shaped section (Mackie 1974, fig. 11 no. 33), though this also is of little value for dating purposes. The C^{14} date from 200 grams of bone in Nu 2 has also been discussed above. The remaining context, Zeta, produced no artefacts useful for defining the chronology of the site.

<u>Mixed pre-broch and early broch deposits: contexts Theta 1-3 and Eta 2.</u>

The phase 2 and 2A deposits were represented by contexts Theta 1-3 and Eta 2. Context Theta was a mixed

early and later deposit containing material from phases 1 and 2 which lay on top of the raised rock surface in the north-western quadrant of the broch interior. The excavator assigned the pottery and other artefacts to phase 2A (Mackie 1974, 79), though this separate, pre broch phase was distinguished, not by structural remains but rather, by the existence of newly occurring pottery types which he ascribed to the arrival of the 'fort builders'. The significance which can be attached to this supposedly separate phase depends on the degree of correlation one is prepared to see between subjectively different pottery styles and changing prehistoric populations. There is no doubt that some of the material derives from earlier contexts and although there is some indecision in the mind of the excavator (Ibid, 40, 41 and 79), it would appear that some also comes from later as well. The occurrence of burnt pottery (eg. no. 136), however, may be indicative of some form of separate pre broch activity as the excavator suggested.

Pottery from Theta 1 (Fig. 45) included vase rims with incised decoration (eg. nos. 114-115) of a very similar type, though possessing a longer rim, to those of the pre broch deposits. Also recovered, however, were sherds of sharply everted rim vessels (eg. nos. 119 and 137) and a number of sherds with impressed zigzag cordons (nos. 125 and 135) of a type not really known from the lower deposits. Also of different type was a fragmentary, small vessel with an everted rim, carinated profile and a red slip (no. 113).

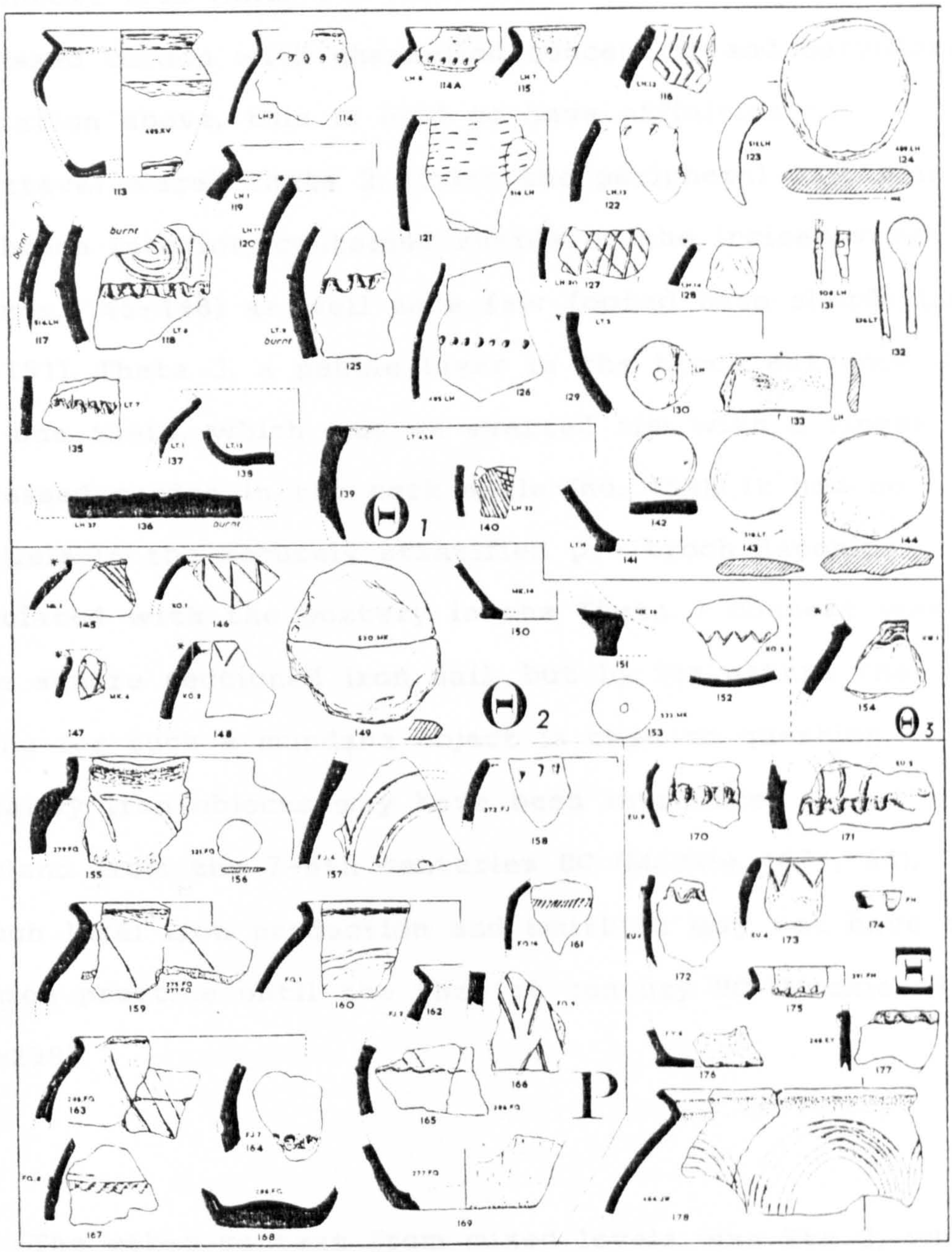


Fig. 45: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

It would have been more at home in the early broch deposits of context Iota (Ibid, 41). Sherd no. 118 had a finger impressed cordon with channelled concentric and curvilinear decoration above, this is held to have affinities to 'Clettraval ware'. Theta 2, under the peripheral paving in the broch interior, contained sherds of the incised vases (eg. nos. 145-148) as well as a few footed base sherds (nos. 150-151). Theta 3, a pebble layer in the broch entrance, had only one sherd, which was an everted rim with a finger impressed cordon in the neck angle (no. 154), it had no parallels in the securely stratified pre broch deposits. Associated with the pottery in the Theta 1 context was a large square sectioned iron nail, but by its nature the dating for such a mundane object is open to question. Certainly iron objects may have been introduced into Scotland from the 7-8th centuries BC (Mackie 1971, 64), though local iron production and smithing may not have been common practice until the the 1st century BC (Mackie 1979, 298-299).

The other context from mixed levels was Eta 2, which was an earth and ash layer under the peripheral broch paving. This contained (Fig. 44) an inturning vase rim sherd with incised lines perhaps forming part of a 'nested' chevron pattern (no. 91). There were also several sherds with finger impressed cordons (nos. 93 and 95) as well as part of an unusual vessel which in addition to having an

everted rim with a cordon in the neck angle, had a second cordon on the body of the vessel (no. 90). A rotary quern with a vertical handle hole was recovered from Eta 2 (Mackie 1974, fig. 12 no. 89), and although again such an object is open to a wide span of dating, its occurrence in the pre broch levels has been used to infer a later date for the brochs of the west than those of the north (Caulfield, 1980).

Broch construction and early occupation levels: contexts Alpha 1-4, Rho, Xi and Iota 2.

Phase 2 deposits were recovered from four locations on the site; the mural gallery, the broch interior, the outer wall and the outer court on the north-western side of the knoll. The C^{14} dates for this phase have been discussed above along with a few general remarks on some of the other dating links for these contexts. These links will now be examined in more detail and related to artefacts recovered from contexts Alpha 1-4, Rho, Xi and Iota 2. In addition to the pottery from the Alpha and Iota 2 deposits, inside the mural gallery, a head of a small ring headed pin was recovered and really no better date for this object can be offered than that suggested by the C^{14} date from the same Alpha 2 context, namely 155 BC-AD 255. The broch outer wall, was represented by context Xi in phase 2, and produced non diagnostic pieces of iron and slag and one fragment of bronze; these are of little help in dating the phase.

Context Rho, the basal deposits in the outer court, was similarly unproductive. Thus the dating for phase 2 and for the pottery within it has to rely on the C^{14} date given above.

The deposits from within the mural gallery (Fig. 46) came from context Alpha and were numbered 1-4 according to the segment of the gallery from which they derived. Alpha 1 and 2 material came from continuous clay floors in the mural gallery chamber, from segments VIII and IX. As noted by the excavator, the pottery recovered seemed to be dispersed at different ends of the chamber according to stylistic type. The majority of the sherds from segment VIII were of 'Clettraval' type (nos. 178-188), although one sherd from an incised vase with an out turned rim and vertical stab marks did occur (no. 207). Under the baulk between segments VII and IX was one sherd of 'Clettraval' ware, although most of the sherds were of coarser pottery. These included vase rims with incised decoration (eg. nos. 199 and 206) similar to sherds from the pre broch levels. There is nothing in the distribution which can support MacKie's hypothesis that the apparent differentiation in the deposition of the sherds represents the living quarters of two people of differing cultural origin (Mackie 1974, 80).

Alpha 3, under the pebble floor at gallery door 3, yielded only a few sherds (Fig. 44), including one vase rim and one base sherd. Alpha 4, a similar context at door 2,

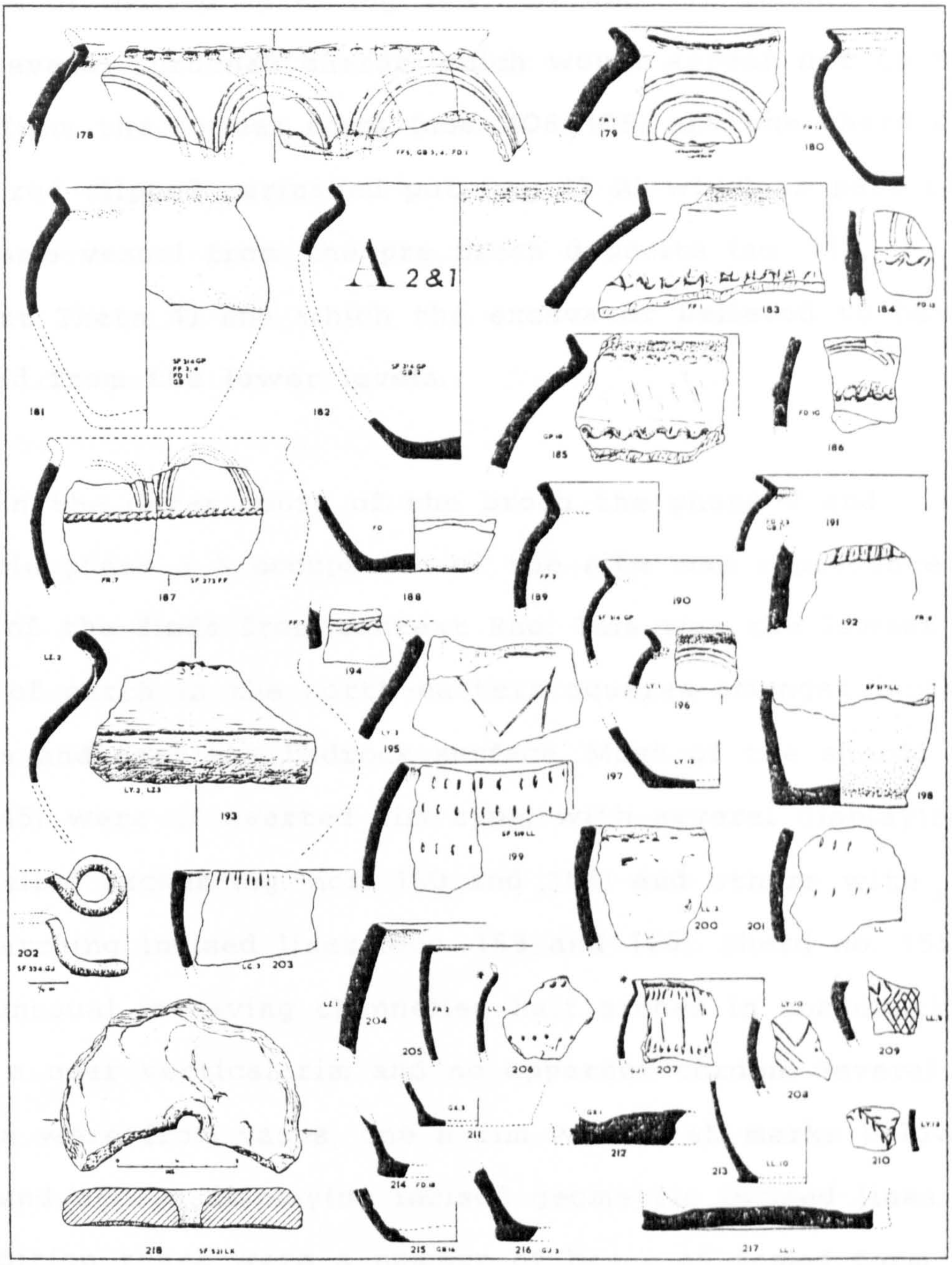


Fig. 46: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

contained sherds of both 'Clettraval' ware (eg. nos. 97 and 98) and of incised vases (eg. nos. 102 and 11). There were also several cordoned sherds which would appear not to have been from the former class (nos. 106-109) and one sherd of a small red slipped carinated pot (no. 87 A) which is part of the same vessel from the pre broch deposits (no. 113, context Theta 1) and which the excavator believed to have derived from the lower levels.

In the outer court of the broch the phase 2 and possible phase 3 A occupation of the site was represented by some of the finds from context Rho. This was the lowest level of earth in the north-eastern squares amongst large stones and near the bedrock surface. Most of the sherds (Fig. 45) were of everted rim type, with several displaying channelled arches (eg. nos. 160 and 163) and others with thin arching incised lines (nos. 159 and 165). Sherd no. 155 was unusual in having channelled half arches in combination with a near vertical rim and no apparent cordon. Several sherds were from vases, one a rim with stab marks below (no. 158) and others displaying incised geometric incised lines. In addition there were a number of bases of domed form (nos. 168-169). Sherd no. 164 had an unusual cordon which was finger tip notched and impressed below the surface of the sherd, it was similar to sherd no. 170 from the outer wall.

This outer wall context, Xi, belonged to phase 2 and the pottery in it came from the rubble core of the rampart

and consisted of large stones, loose earth and midden material. Some of the sherds (Fig. 45) bore resemblance to those from the underlying red midden (context Nu) in that they were vases with incised decoration (eg. no. 173). Most of the pottery was of everted rim type and several sherds had applied zigzag cordons beneath (eg. nos. 172 and 177) with no. 171 also displaying channelled arches above, and therefore having similarities to 'Clettraval' ware. Two of the sherds had internal fluting on the rim (no. 174 and 178 A) with no. 178 A being unusual for having a sharply everted rim in addition to close set channelled arches below. It should be noted that in the excavator's published figures two sherds are labelled as no. 178 on separate illustrations, although only one is described in the appendix. For the sake of clarity sherd no. 178 from context Xi has been renumbered 178 A and is described under this label in the pottery appendix to this chapter.

During phase 3 the broch interior was occupied giving rise to the Iota deposits. These contained a much wider variety of metallic and other artefacts, including Roman pottery and glassware. Amongst the metalwork were one complete and two parts of bronze rings, two of these may have been designed to be worn, the other is too small for such a function, in any case no firm date can be ascribed to any of the three. Another piece of bronze may be part of an oval headed ring pin. Whole or parts of three small yellow vitreous paste beads were also recovered, these class 8

beads occur on many of the west coast sites and are generally assigned to a date from the first century BC to the first few centuries AD (Guido, 1978, 76). Perhaps capable of more precise dating are the fragments of Roman glassware and the spindle whorl made from a piece of Roman coarse ware, although the dangers of using this type of material are well known (Clarke, 1971, 23-25). So while some comment may be passed on the objects, caution still ought to be observed.

The piece of Roman coarse ware was assigned an Antonine date though its re-use as a spindle whorl indicates that it may have been in use for some indeterminate period before deposition; and although the whorl provides a terminus post quem for the context, a later one is offered by the following object. This is a piece of rim from a small bowl of colourless glass, thought to be of a type manufactured in the Cologne area, and ascribed to the period AD 160-250. The significance of this piece has been discussed by MacKie (1974, 94), its secure stratification indicating that the broch was being used in its primary phase (3A) at least during the latter part of the 2nd century AD. Possibly also from a phase 3A context is the mauvish red ring bead found in Rho 3, the trench between the broch and the outer wall. This is of Mrs. Guido's class 14, a similar type to the one found in 1968 in the excavation of displaced wall debris at Dun Cul Bhuirg, Iona (Ritchie and Lane, 1981, 219). The group appears to have been manufactured in Aberdeenshire

during the 1st/2nd centuries AD (Guido, 1978, 87-89).

The pottery from the early broch occupation level Iota, included sherds from the broch interior, as well as from the cess pit in the mural gallery, possibly including phase 3 B. The broch interior floor was a mixture of sand, gravel, earth and stones with patches of peat ash which overlay the peripheral paving. It was probably brought to the broch to even up the floor level. This early broch context also produced 'Clettraval' ware and a new base type of omphalos form (Fig. 48), examples of the former include nos. 232-233 and of the latter no. 249. The majority of the sherds, however, were of incised vase and barrel shaped urn type, similar to those of the pre broch levels. Sherds nos. 266 and 267 are examples of the latter and both have incised geometric patterns and slightly inturning rims, with the vases being represented by nos. 252-257. Several almost complete vessels were found, including an urn with feathered zigzag lines (no. 220), an urn with incised pendant chevrons infilled with hatching and herring bone (no. 219) and a large part of another urn decorated with lozenges infilled with cross hatching pattern (no. 231).

One of the other urns had an unusual decoration of finger tip impressions over the outside of the vessel (no. 276), with another unusual decoration occurring on sherd no. 279 and consisting of equilateral triangles sub-divided into smaller hatched and unhatched triangles. Two other vessels

worthy of note are represented by sherds nos. 226 and 280. The latter was an urn with an inturning rim and incised lines probably forming quadrilaterals with the impressions of a small bronze ring headed pin between the lines. The former was an almost complete miniature pot, the so called 'Wessex bowl' which has been said to have had parallels with the bead rimmed bowls of Iron Age southern Britain (Mackie 1974, 43). A spear butt mould of door knob type (no. 291) was recovered from the top of the Iota context in the south-eastern quadrant of the broch and has parallels with the moulds from Dunagoil, Bute (Raftery, 1982, 87).

Context Iota 2 was contained within the cess pit, and was the earliest post construction layer within the mural gallery. Only a few sherds were recovered from the pit (Fig. 47), this is perhaps not surprising given the probable function of the feature (Mackie 1974, 25). Those recovered included three pieces of a rim of a gritty barrel urn (no. 221), parts of an incised urn (no. 230) and a piece of a thin based vessel.

<u>The end of the broch and its demolition: contexts Kappa, Lambda, Mu, Sigma, Tau and Beta.</u>

This period of the site's usage was represented by pottery in phases 3B, 4A and 4B in contexts Kappa, Lambda, Mu, Sigma, Tau and Beta. During phase 3B and up to the end of phase 4 the site seems to have undergone a change in

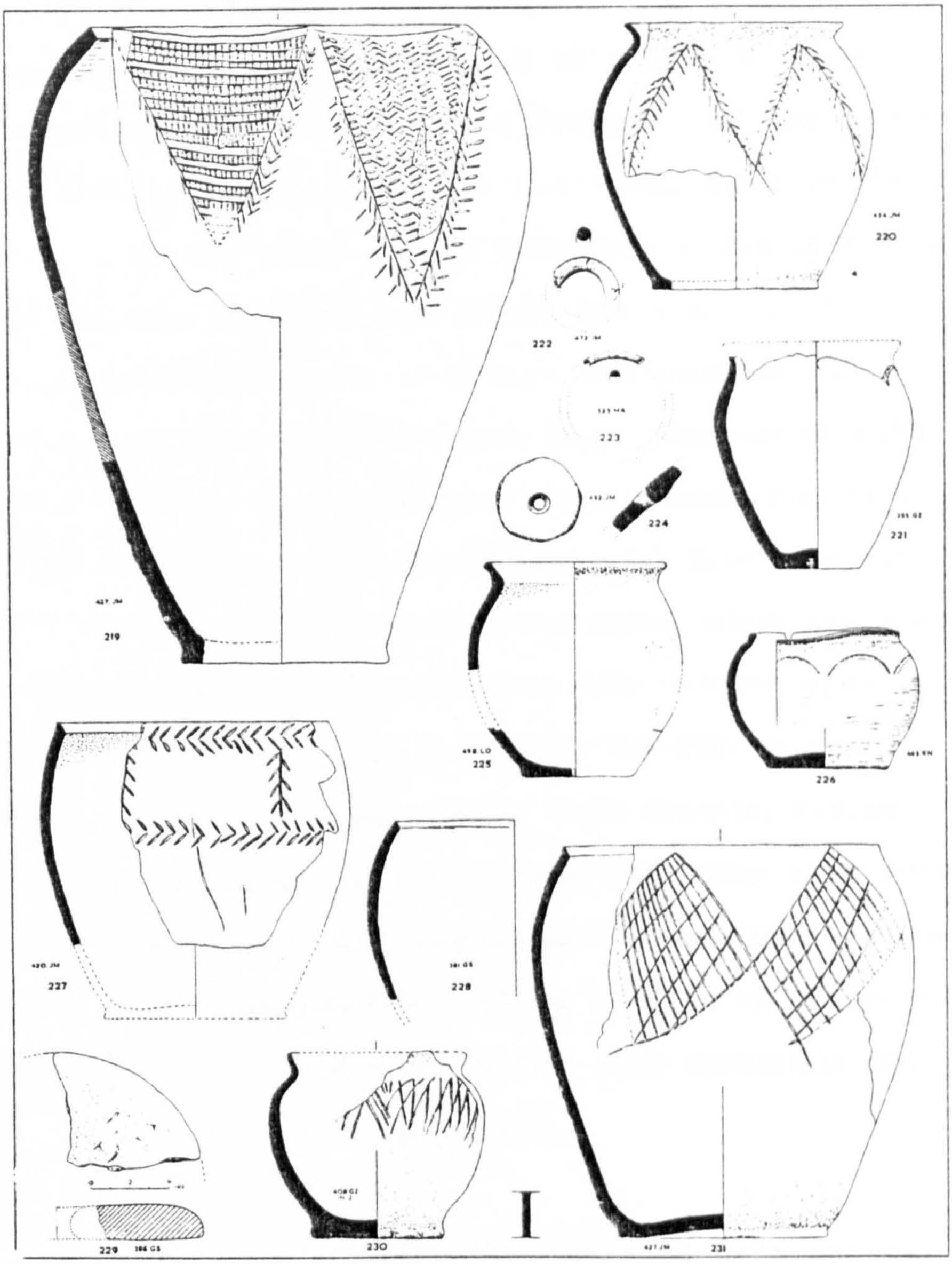


Fig. 47: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

function, perhaps becoming a form of round farm house within the ruined and lowered walls of the broch. In the broch interior this period is represented by contexts Kappa, Lambda and Mu. Kappa contained a fragment of Roman glass of 1st/2nd century type as well as two small glass beads, one of which is of the class 8 type discussed above in the Iota context. Lambda produced few finds, but a piece of Samian ware from a flanged bowl of a type not made before AD 140 was recovered from Mu, the earth floor associated with the secondary walling. It is somewhat paradoxical that this and nearly all the rest of the Roman material from the later deposits on the site are of Antonine date, when the glass bowl thought to be manufactured in the Cologne area and found in Iota dates to the period AD 160-250. It perhaps is indicative of the glassware, being more fragile, having a shorter lifespan, whereas the Samian ware may have survived in use for many years and indeed have been reused, as was the case for the spindle whorl from Iota. In any case the problems associated with the use of such materials for dating have already been discussed.

Inside the mural gallery the phase 4B Beta context yielded two pieces of glass from Roman bottles or jugs, one of which was thought to be of the type used by the Roman army and dated to the period AD 50-150 and the other to the period AD 70-130 (Mackie 1974, 149). In addition a complete turn of a spiral from a bronze finger ring was discovered, although to attach a date to this object alone might be

foolhardy (Clarke, 1971, 25-28). The outer court, contexts Tau and Sigma, contained further yellow class 8 beads, as well as pieces of Roman bottle of 1st/2nd century type, thus confirming the general period suggested by the other contexts for this phase.

Kappa was inside the broch interior and consisted of a thin layer of red and black peat ash associated with a hearth overlying the Iota deposits and running under the secondary walling. Some of the sherds from this context (Fig. 48) may have derived from Iota, but of those known to have come from the ash, and therefore definitely from context Kappa, were both everted rim and incised vase vessels. Examples of the former included nos. 305 and 307, with sherd no. 304 being part of the rim of an inturned rim urn with geometric decoration of incised line and stab marks. The prehistoric mixing of contexts was confirmed by the recovery of one cordoned sherd (no. 308) which was part of the double cordoned, everted rim vessel (no. 90) from context Eta 2, from the upper levels of the pre broch wattle and daub hut.

During context Lambda (phase 4 A), several thin layers were laid down between the period of the usage of the hearth and the demolition of the broch and the subsequent construction of the secondary wall. Several sherds of everted rim vessels (Fig. 49) were recovered (nos. 309-310 and no. 313), as well as others with cordons (nos. 311-312

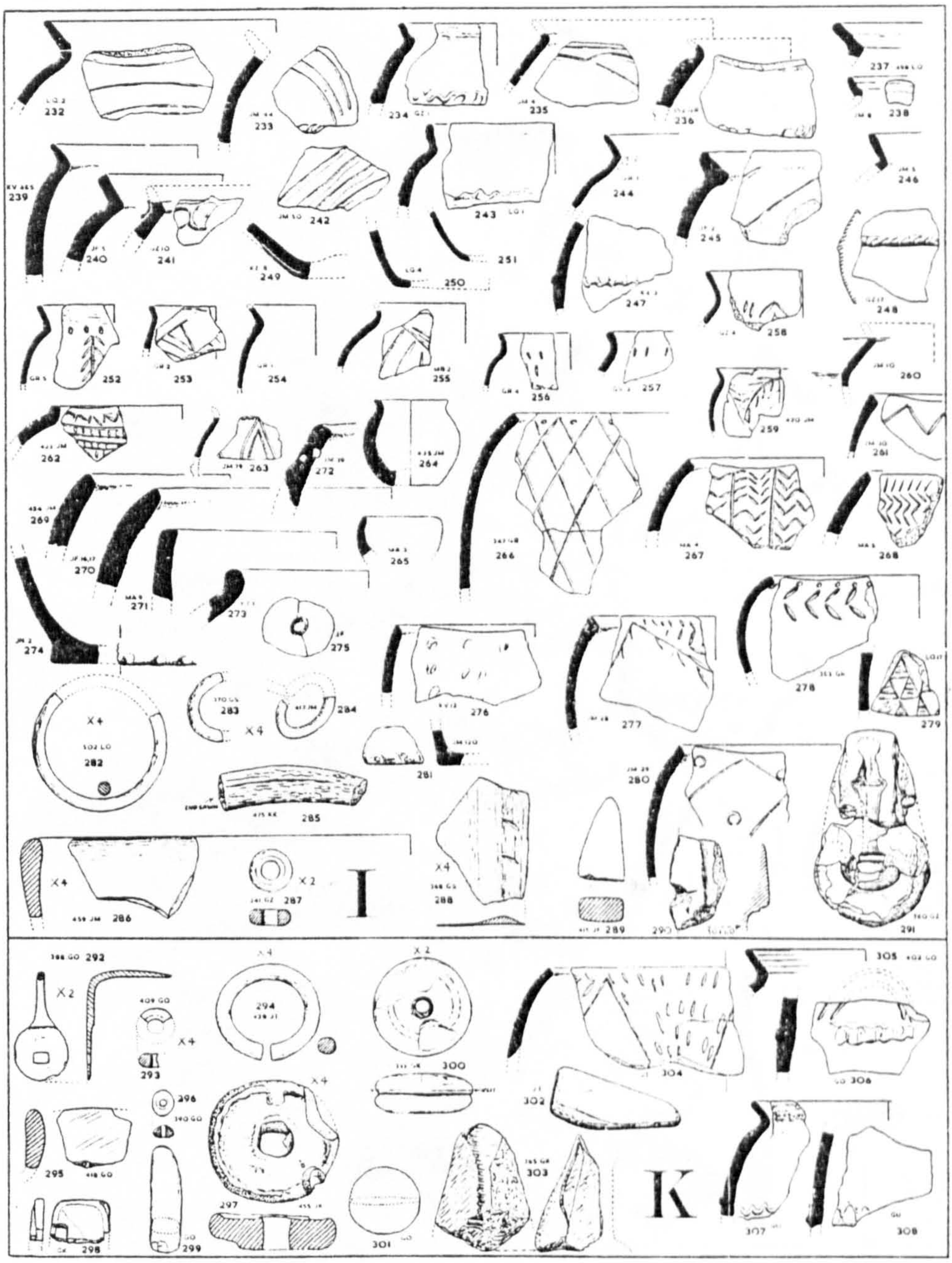


Fig. 48: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

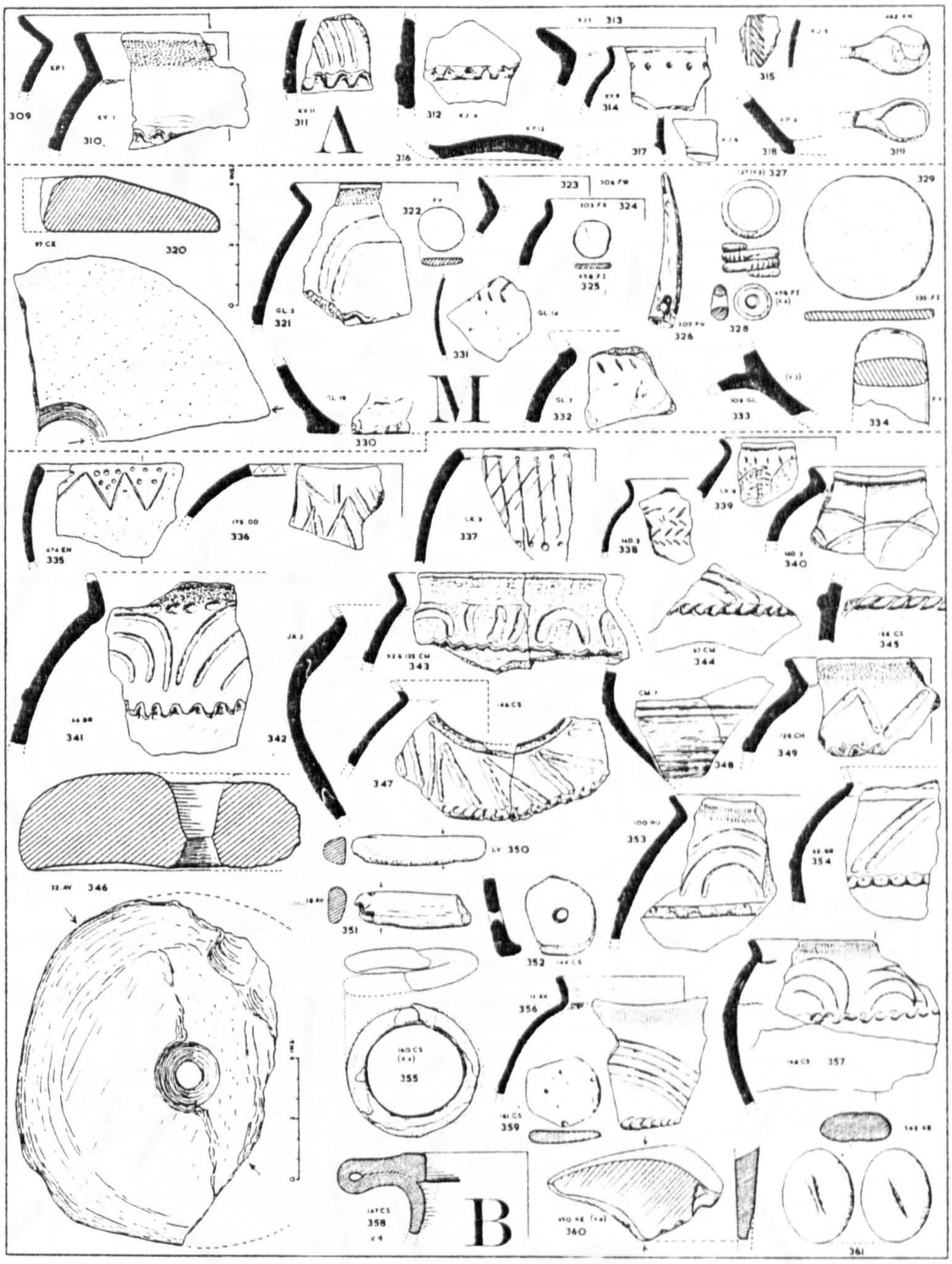


Fig. 49: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

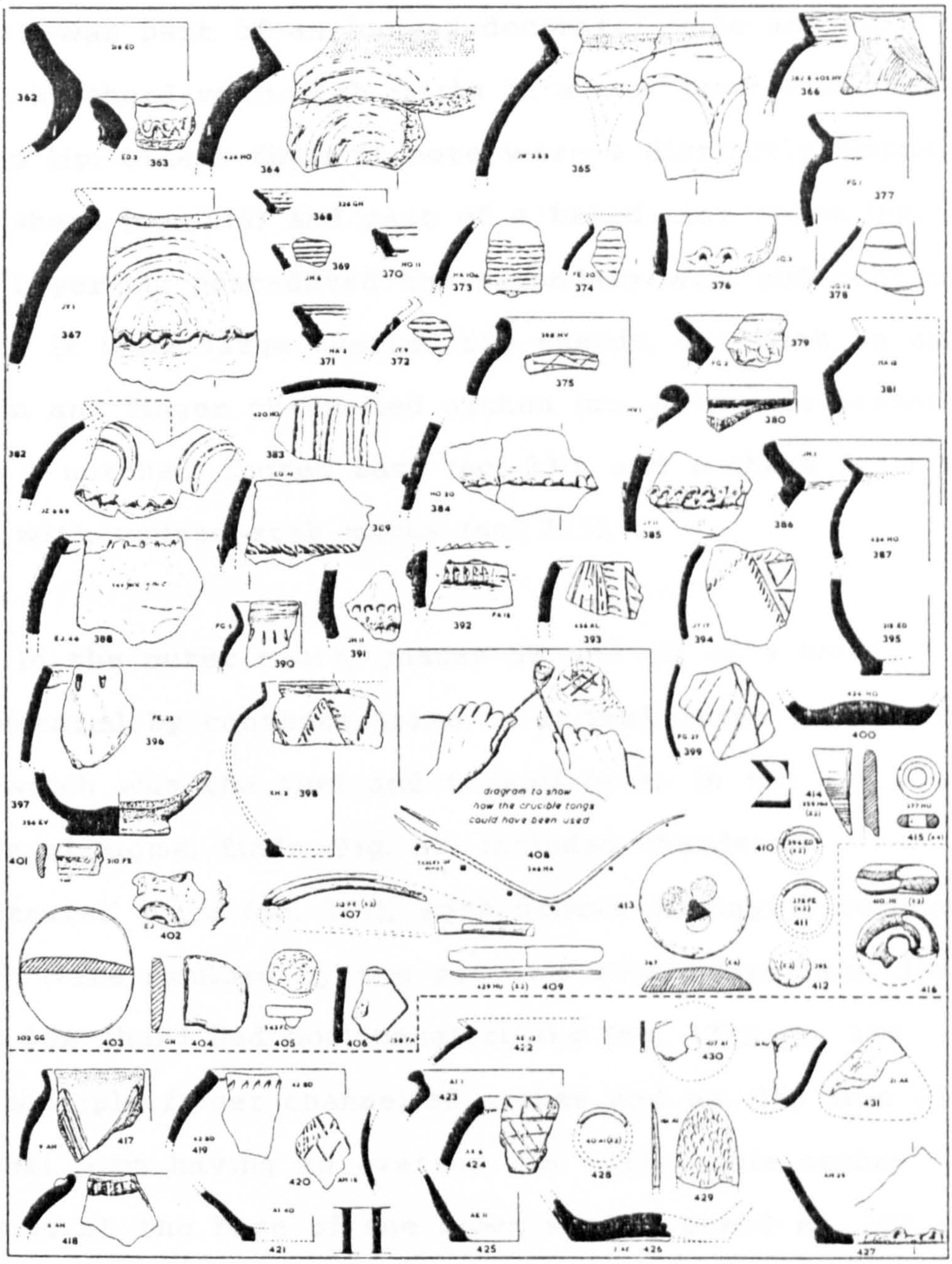


Fig. 50: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

and 317) of which no. 311 had quadruple finger channelled arching lines and no. 317 an unusual smooth cordon. Sherd no. 315 was part of an incised decorated vase and no. 314 a vase rim sherd with stab marks in a row just beneath the out turned lip. Others finds of note were a distinctly omphaloid base sherd (no. 316) and part of a baked clay spoon (no. 319). Layer Mu post-dated the secondary wall and contained within it were large everted rim sherds, one with an applied cordon and finger channelled arches (no. 321). Also present were a notched, footed base (no. 330) and a sherd from a vase with incised stab marks (no. 331).

In the outer court, phases 3B and all of 4 were represented by contexts Sigma, a drifted earth layer, and Tau which was the turf and topsoil level. In the early levels of Sigma, finds (Fig. 50) included sherds of 'Clettraval' ware (no. 367), with others displaying cordons which were moulded by the potter's finger tips (nos. 384 and 385). One sherd had horizontal rilling (no. 372), no. 364 had multiple finger channelled arches and no. 365 was of unusual form having an everted rim with single arches meeting at the base of the down stroke. Sherd no. 398 was reckoned to be similar to those from pre broch contexts by the excavator (Mackie 1974, 61), though there is no reason why it might not also be considered to be very alike to those from Iota, notably no. 220. Drifted earth deposits in Sigma contained a variety of sherds, including two pieces of Roman Samian ware which were dated to the period AD. 140-180.

Other sherds from the context displayed several rim and decorative types; bead rim in nos. 375 and 380, fluted rims such as nos. 366, 368 and 369, a carination in no. 381 and everted rim with applied neck cordon in nos. 363, 376 and 379. Of these no. 366 was the most unusual, in fact without parallel in Scotland, because in addition to the five even fluted lines in the interior it had a complex decoration of triangles filled with the teeth marks of a fine toothed comb.

Also in the outer court was context Tau, the topsoil and turf layer of phase 4B. This layer produced pottery (Fig. 51) which was mainly of everted rim and cordoned type, including a number similar to those of Sigma, having applied neck band cordons (nos. 435-436). Some sherds had 'Clettraval' style decoration (eg. no. 439), some bore rim fluting (no. 437) whilst others were of the out turned rim incised vase type, one base sherd had finger tip impressions in the interior and one unusual everted rim sherd had parallel diagonally incised lines on the interior lip.

The phase 4B context in the mural gallery was a drifted earth layer which lay on top of the Alpha deposits and was known as Beta 1-5 according segment. Beta 1 consisting of segments VII and VI, was composed of earth and clay levels which contained both 'Clettraval' and incised vase sherds (Fig. 49). Many of the former were thought by the excavator to be of 'devolved' form, for example, nos. 347 and 357

(Mackie 1974, 27). Sherd no. 345 had an unusual cordon of a tube of clay applied to the wall of the vessel and then slashed obliquely to give a cable effect. Beta 2, segments I, II and I/IX up to door 3 inclusive, had a similar mix of 'Clettraval' and incised sherds though included one exceptionally fine fluted rim of fine hard red fabric (no. 356). This sherd may have an orange slip and had five closely spaced finger channelled arched lines and a finger moulded cordon. Beta 3, in segments VIII and IX, produced a greater quantity of sherds of incised vases. Notable amongst these was one with a distinctive pattern of an incised line beneath the rim forming alternate upright and pendant chevrons with the triangles above the line infilled with impressed dots (no. 335). Another vase rim (no. 337) had decoration of a double row of impressed dots with incised lattice inbetween.

On one of the unillustrated sherds there was the impression of a ring, possibly made by a ring headed headed pin. Beta 4 was from segments III and IV and inside door 1, and though no directly connected with the other Beta deposits was thought to be contemporary with them. The pottery recovered included large everted rim sherds which were decorated with zigzag cordons and channelled arching lines (eg. nos. 353 and 354). The rim of the vase no. 336 had a faint zigzag incised line along the top of the inturning rim, with channelled instead of incised lines in a seemingly random crossing pattern beneath. Beta 5, segments

V, V/VIII and V/IV, contained a little pottery, again sherds of 'Clettraval' ware of a 'degenerating' nature (no. 343) as well as incised vase sherds with parallel channelled lines (no. 354). Sherd no. 348 was unusual for having a horizontal channelled line on the shoulder of the vessel.

The final period of occupation of the site was in phase 5 when the ruins of the broch were sporadically inhabited. The contexts included more Roman Samian ware, notably a much abraded piece of bowl of Antonine date from Gamma 1. Also possibly from the Gamma contexts was a small part of an armlet of vitreous milky blue paste, for which no date is advanced. The two C^{14} dates from Gamma 2 and 6 give a broad band for the phase of AD 225-890 and AD 10-430 respectively, perhaps confirming the excavator's suspicion that the deposits were disturbed. The piece of blue green glass recovered from outside the outer wall in trench NW/F, context Upsilon 2, was of 1st/2nd century type.

In the mural gallery, context Gamma, the deposits were of loose stone rubble and earth, in some places also including collapsed lintels. Gamma 1 in segments I, II and baulk II/IX, had a few sherds of an abraded Samian ware from an Antonine bowl as well several sherds of a fine incised vase (Fig. 51) with a row of impressed dots and incised lattice beneath the rim (no. 466). In Gamma 2 the deposits in segment IX were more confused, both in the stratigraphy and during the excavation. This context contained a burial,

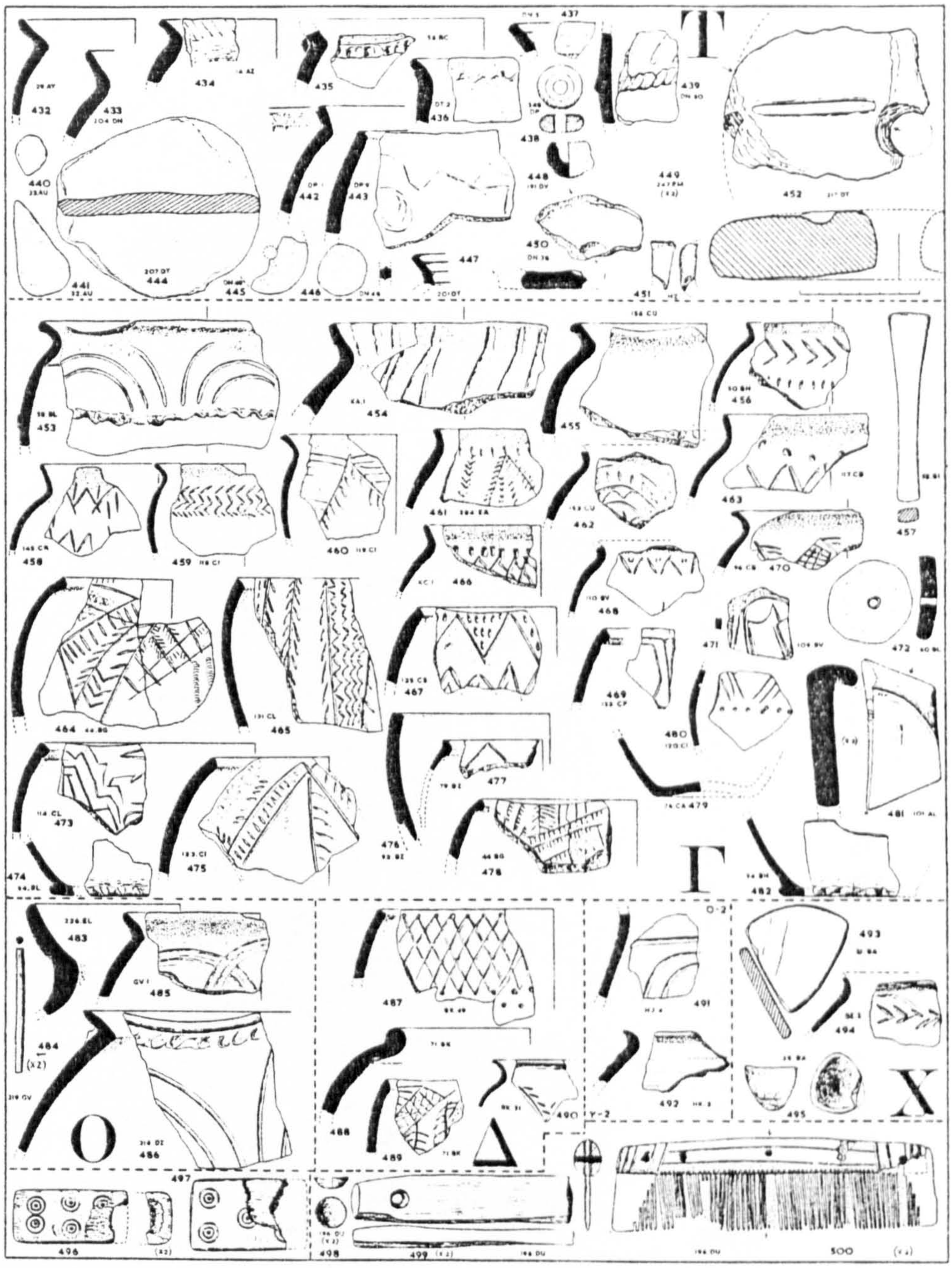


Fig. 51: Dun Mor Vaul pottery. Scale just under 1:5 (after Mackie 1974).

Fig. 52: Dendrogram of sampled pottery from Dun Mor Vaul.

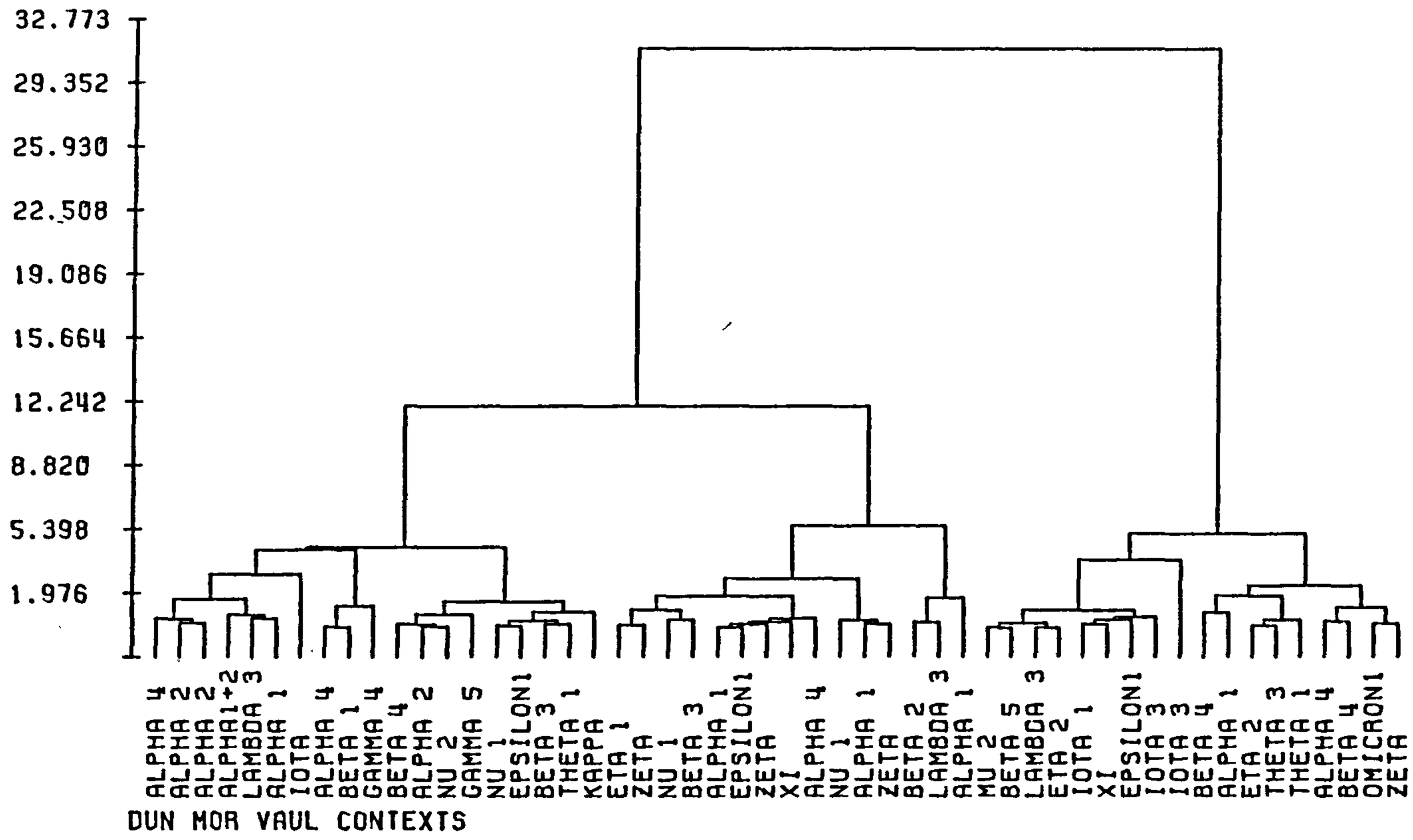


Fig. 53: Dendrogram of sampled pottery from Dun Mor Vaul, labelled by context.

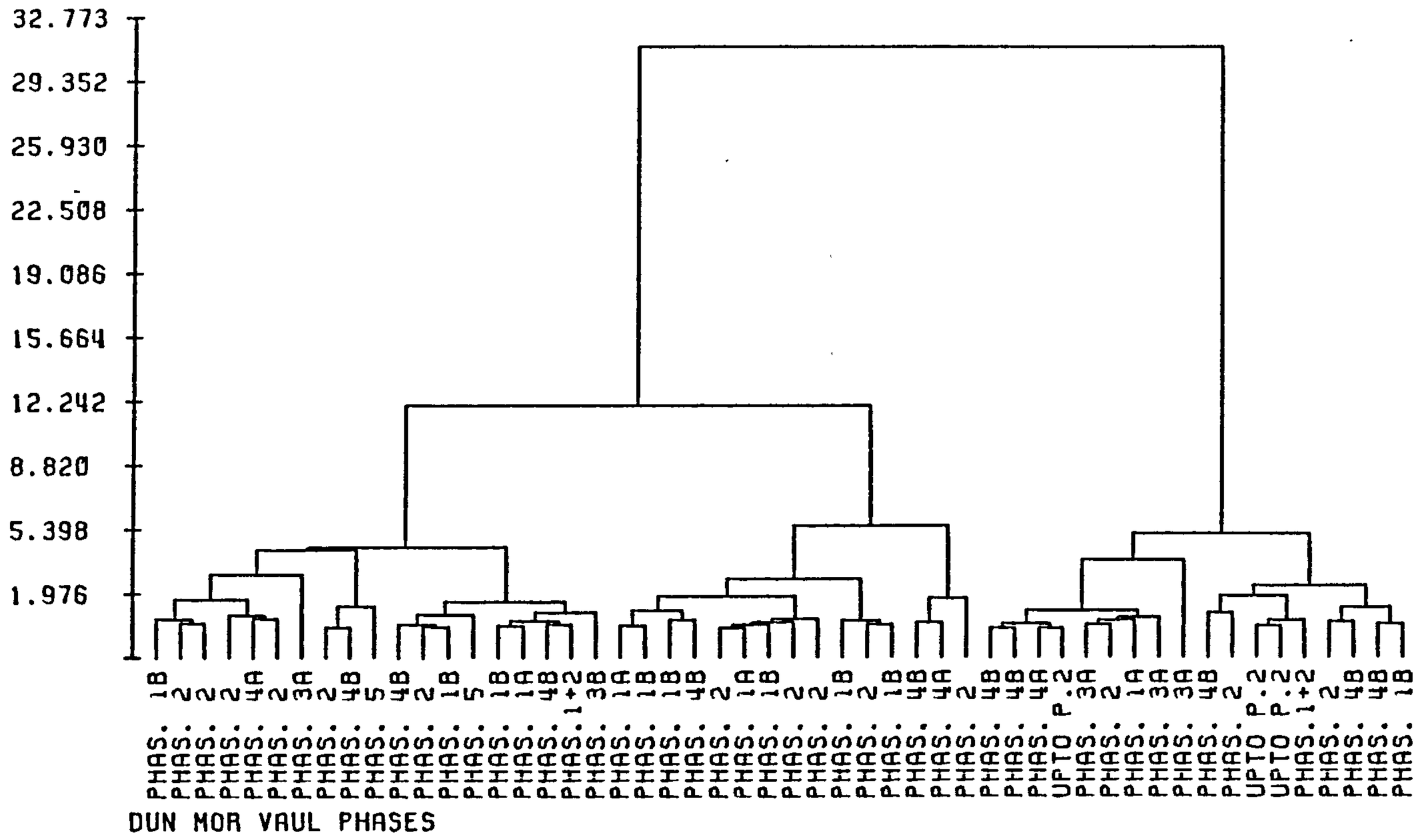


Fig. 54: Dendrogram of sampled pottery from Dun Mor Vaul, labelled by phase.

Dun Mor Vaul

Cluster One: NAA samples 19, 24, 30, 22, 35, 70 and 463. Cluster Two: NAA samples 36, 45 and 49

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	0.1	<0.0	0.1	10.8	51.4	40.0
Accept Null hypo.	No	No	No	Yes	Yes	Yes

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 55.

Dun Mor Vaul

Cluster One and Two: NAA samples 19, 24, 30, 22, 35, 70, 463, 36, 45 and 49. Cluster Three: NAA samples 25, 31, 51, 27, 26, 54, 57, 64 and 40.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	74.7	27.9	80.9	5.65	0.1	29.1
Accept Null hypo.	Yes	Yes	Yes	Yes	No	Yes

Null hypothesis: Clusters One and Two come from the same population as Cluster Three.

Fig. 56.

Dun Mor Vaul

Cluster Four: NAA samples 20, 62, 55 and 56.
Cluster Five: NAA samples 28, 65, 68, 38 and 67.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	35.3	81.4	27.4	2.1	75.2	18.9
Accept Null hypo.	Yes	Yes	Yes	No	Yes	Yes

Null hypothesis: Clusters Four and Five come from the same population.

Fig. 57.

Dun Mor Vaul

Cluster Four and Cluster Five: NAA samples 20, 62, 55, 56, 28, 65, 68, 38 and 67. Cluster Six: NAA samples 32, 42 and 63.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	3.23	12.5	4.54	94.8	96.9	<0.0
Accept Null hypo.	No	Yes	No	Yes	Yes	No

Null hypothesis: Clusters Four and Five come from the same population as Cluster Six.

Fig. 58.

Dun Mor Vaul

Cluster Four, Cluster Five and Cluster Six: NAA samples 20, 62, 55, 56, 28, 65, 68, 38, 67, 32, 42 and 63. Cluster Seven: NAA samples 29, 50 and 60.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	25.7	54.5	33.3	6.5	<0.0	<0.0
Accept Null hypo.	Yes	Yes	Yes	Yes	No	No

Null hypothesis: Clusters Four, Five and Six come from the same population as Cluster Seven.

Fig. 59.

Dun Mor Vaul

Cluster Nine: NAA samples 23, 53, 41, 43 and 44.
Cluster Ten: NAA samples 47, 58, 48 and 66.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	4.35	1.93	5.00	52.4	56.9	50.1
Accept Null hypo.	No	No	No	Yes	Yes	Yes

Null hypothesis: Clusters Nine and Ten come from the same population.

Fig. 60.

Dun Mor Vaul

Cluster Eight: NAA samples 21, 33, 37, 39, 46, 52, 61, 69 and 58. Cluster Nine and Cluster Ten: NAA samples: 23, 53, 41, 43, 44, 47, 58, 48 and 66.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	29.0	1.79	90.7	<0.0	<0.0	33.1
Accept Null hypo.	Yes	No	Yes	No	No	Yes

Null hypothesis: Cluster Eight comes from the population as CLuster Nine and Cluster Ten.

Fig. 61.

Dun Mor Vaul: Cluster Number 1

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
19	97	2	Alpha 4	everted	groove under rim, wavy cordon, four channelled arches
24	187A	2	Alpha 2	-------	wavy cordon, concentric arches
30	186	2	Alpha 2	-------	wavy cordon, concentric arches
22	178	2	Alpha 1+2	everted	finger tip impressions below rim, double shallow arched lines, cordon probably missing
35	312	4A	Lambda 3	-------	wavy cordon
70	210	2	Alpha 1	-------	Incised fern pattern in zigzags
463	291	3A	Iota	-------	Mould for a spear butt of Irish 'door knob' type

Fig. 62.

Dun Mor Vaul: Cluster Number 2

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
36	100	2	Alpha 4	everted	applied cordon pressed into a corrugation
45	345A	4B	Beta 1	-------	cordoned
49	455	5	Gamma 4	everted	applied and impressed cordon

Fig. 63.

Dun Mor Vaul: Cluster Number 3

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
25	353	4b	Beta 4	everted	wavy applied cordon, three concentric channelled arches above
31	184	2	Alpha 2	-------	applied wavy cordon, at least two concentric arches above
51	8	1B	Nu 2	-------	bone impressed applied cordon
27	453	5	Gamma 5	everted	applied impressed cordon, triple channelled semi-circles above
26	19	1B	Nu 1	inturned	Perhaps slipped, fluted interior possible tilted ring headed pin stamps on the exterior
54	40	1A	Epsil. 1	thin out turned	applied wavy cordon, small vase
57	339	4B	Beta 3	out turned	slashes beneath rim, incised pattern below
64	121	1+2	Theta 1	inturning	vertical rows of short horizontal lines
40	306	3B	Kappa	-------	applied cordon, traces of arches

Fig. 64.

Dun Mor Vaul: Cluster Number 4

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
20	87	1A	Eta 1	inturned	two rows of large ring pin stamps
62	68	1B	Zeta	vertical	large incised lattice, horizontal striations on rim
55	15	1B	Nu 1	-------	eyebrow motif made by a bronze circular object, dots in eyes
56	337	4B	Beta 3	inturned	incised lattice between two rows of impressed dots

Fig. 65.

Dun Mor Vaul: Cluster Number 5

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
28	187	2	Alpha 1	-------	wavy applied cordon, traces of concentric arches above
65	36	1A	Epsil. 1	inturned	thin incised chevrons, feather pattern beneath
68	70	1B	Zeta	inturned	two horizontal rows of large incised zigzag pattern
38	177	2	Xi	-------	applied wavy cordon
67	102	2	Alpha 4	-------	hatched and plain 'nested' triangles, also 'nested' chevrons

Fig. 66.

Dun Mor Vaul: Cluster Number 6

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
32	16	1B	Nu 1	-------	impressed pits and ring pin stamps, bucket shaped urn
42	203	2	Alpha 1	inturned	row of vertical nail marks below the rim, urn
63	71	1B	Zeta	inturned	incised part infilled panels, urn

Fig. 67.

Dun Mor Vaul: Cluster Number 7

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
29	356	4B	Beta 2	everted	fluted internal rim bevel, wavy cordon, five concentric arches
50	311	4A	Lambda 3	-------	wavy cordon, four arches above
60	209	2	Alpha 1	-------	incised lines, part cross hatched

Fig. 68.

Dun Mor Vaul: Cluster Number 8

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
21	311	4A	Lambda 3	-------	wavy cordon, four arches above
33	343	4B	Beta 5	everted	wavy cordon, curving grooves and channelled arches, groove in neck
37	310	4A	Lambda 3	everted	wavy cordon
39	90	2	Eta 2	everted	two wavy cordons, one in neck
46	243	3A	Iota 1	everted	remnants of a wavy cordon
52	170	2	Xi	-------	cordon deeply pinched in a ridge and smoothed
61	34	1A	Epsil. 1	inturned	plain bucket shaped urn
69	263	3A	Iota 3	-------	tops of two 'nested' chevrons
58	267	3A	Iota 3	inturned	incised close set fern pattern

Fig. 69.

Dun Mor Vaul: Cluster Number 9

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
23	354	4B	Beta 4	everted broken	impressed cordon, two straight channelled lines above
53	207	2	Alpha 1	everted	vertical stab marks and a few incised lines, vase
41	93	2	Eta 2	-------	finger tip impressed cordon
43	154	2	Theta 3	everted	wavy cordon in the neck angle
44	118	1+2	Theta 1	-------	wavy cordon, concentric curved lines above

Fig. 70.

Dun Mor Vaul: Cluster Number 10

Sam. Num.	App. Num.	Phase	Context Summary	Rim Type	Decorative or other features
47	106	2	Alpha 4	-------	internal horizontal grooves, cordon part straight, part wavy
59	336	4B	Beta 4	inturned	zigzag incised line on rim edge, complex of grooves on exterior
48	486	4B	Omic. 1	everted	applied impressed neck cordon, double channelled arches below
66	66	1B	Zeta	out turned	incised vertical lines below rim

Fig. 71.

of uncertain age dating between the Norse period and recent times. The pottery, nevertheless, would not be unusual from Iron Age contexts, and was thought to be all of this period by the excavator (Mackie 1974, 31). Of particular interest was sherd no. 469 which has what may be part of an incised animal on it, and may be a part of the vessel to which sherd no. 471 from Gamma 3 belongs. Other sherds from Gamma 3, in segments V V/VIII and V/IV were a fine urn rim with pendant incised triangles below the rim filled with impressed dots. The remainder of the Gamma contexts nos. 4-6 produced more incised vase sherds, several 'Clettraval' sherds and some rims which were thought to have affinities with vessels from Balevullin (nos. 477 and 480). Surface occupation in the mural gallery was represented by context Delta, with further urn rims and incised sherds and one unique bead rim (no. 488).

Other phase 5 deposits which produced pottery included Upsilon 2, Omicron 2 and Chi (Fig. 51). The former was a turf layer on the wallhead in trench NW/F in the outer court and had one sherd with a channelled design (no. 491). Omicron 2, a rubble level from the same part of the site, contained one notable sherd (no. 492) with an everted rim and broad horizontal fluting on the exterior. Chi, was a level of dry rubble in the broch interior and amongst several sherds was a vase rim with an out turned lip and geometric decoration (no. 494). It is significant that this context also contained a sherd from the red slipped

carinated vessel from context Theta 1 (no. 113) illustrating that parts of the pre broch deposits have previously been dug up and deposited in other places. Such disturbances may in part have been due to the 'excavations' carried out in the nineteenth century.

NAA results.

A total of 52 sherds from Dun Mor Vaul were analysed by NAA and the results are shown in the dendrogram Fig. 52. Sherds from a range of decorative types and from a variety of contexts were examined to establish if patterns which were subjectively perceived in an examination of the pottery were echoed in the vessels' fabrics. The sherds are labelled by context in Fig. 53 and by phase in Fig. 54 with the division of the dendrograms into significant clusters being shown in Figs. 55-61. The 'twosample t' tests demonstrate that the 52 analysed sherds could be ascribed to 10 distinct clusters and the descriptions of the members of these clusters are summarized in Figs. 62-71.

An examination of Figs. 62-71 reveals that the groupings produced by the chemical analysis of the fabrics were not mirrored by any grouping which might be archaeologically applied, either in terms of chronology or in form and decoration. This can be seen to be the case regardless of the level of the dendrogram which is examined, ie. no one cluster contains sherds of specific decorative

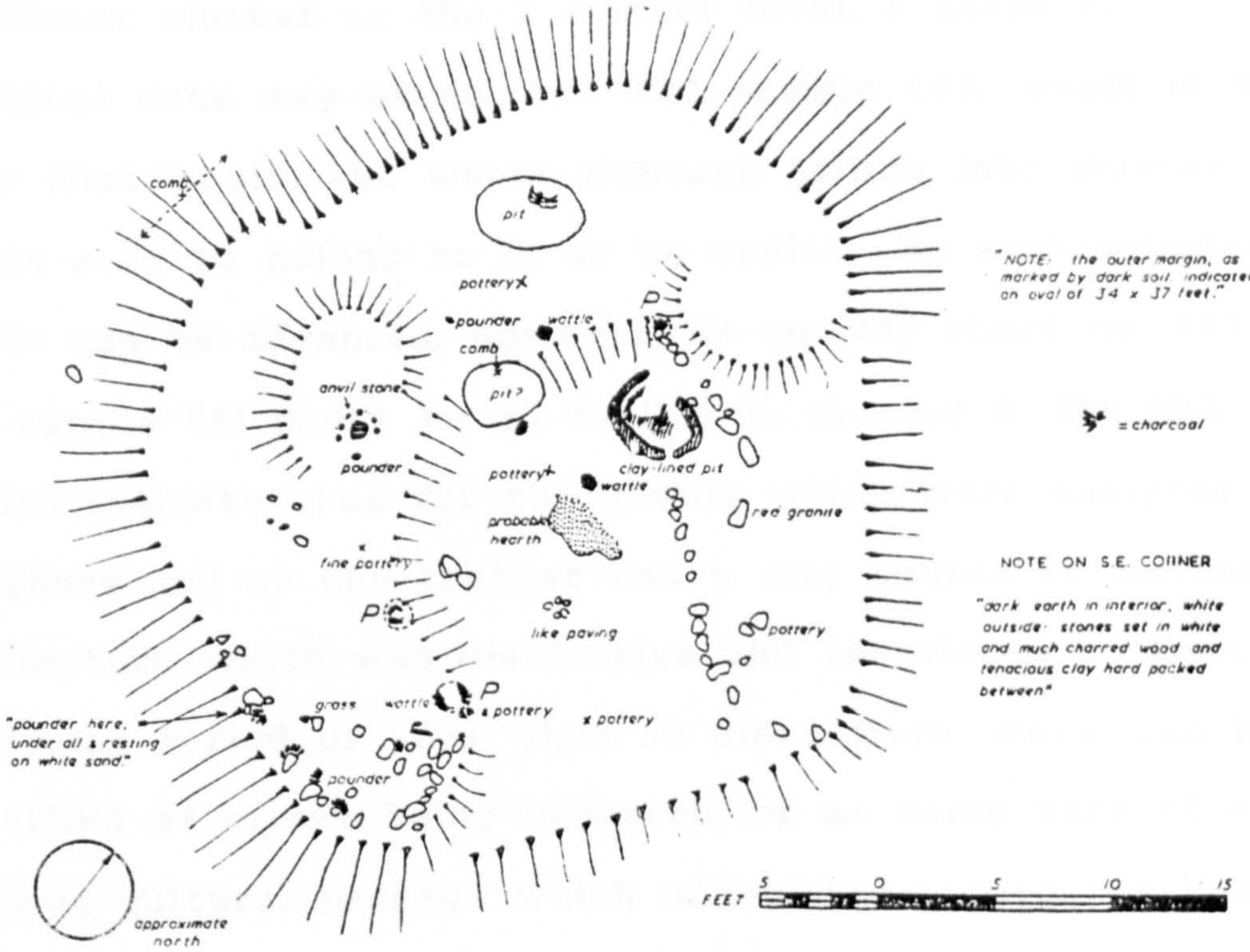


Fig. 72: Balevullin site plan (after Mackie 1963).

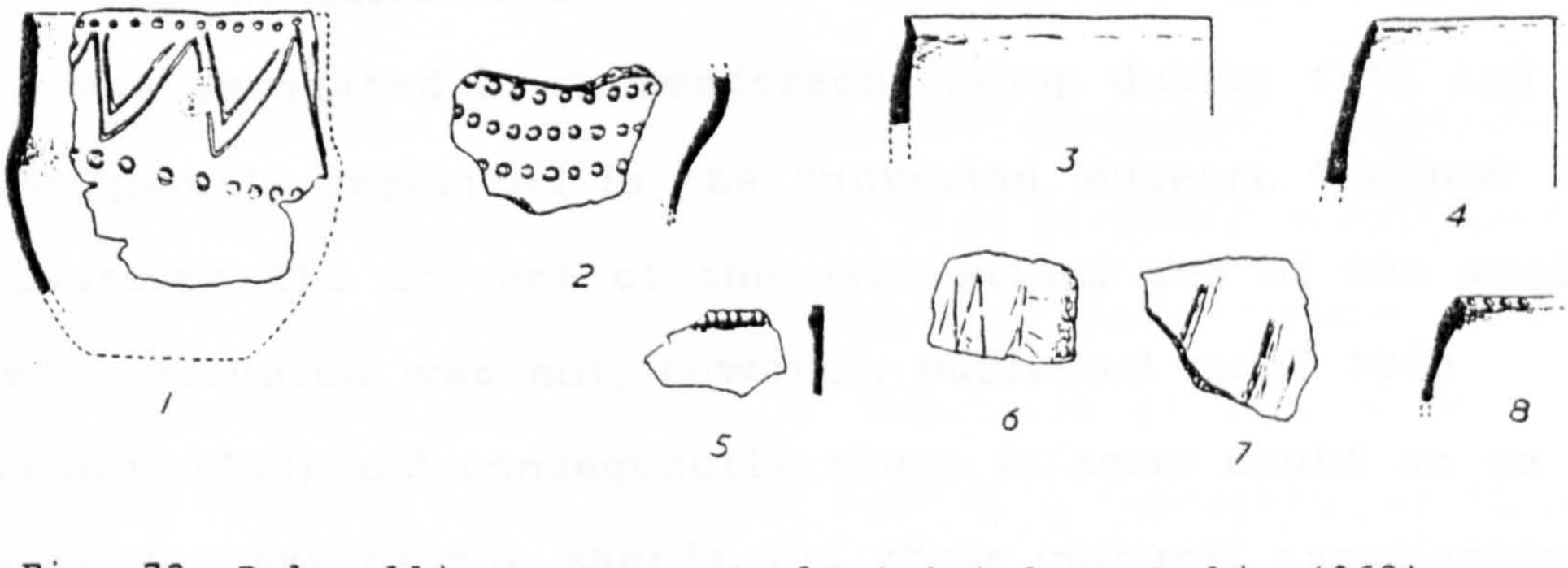


Fig. 73: Balevullin pottery. Scale 1:4 (after Mackie 1963).

type, context or phase whether one looks at the 10 significant cluster or the 2 cluster level. A sherd of individual note may be no. 291 (NAA sample 463) which is the spear butt mould, and which although falling into cluster 1 can be seen to belong to it as an outlier. No archaeological reason can be advanced, however, as to why sherd no. 267 (NAA sample 58) might be an outlier in cluster 8. The NAA results indicate that for the sherds which were analysed, no one phase and no one context had a clay source or method of manufacture which was distinctive and restricted to that particular period or area. Thus no distinctive 'ware' can be identified as either being imported, or as being part of a changing cultural package which might, and indeed has been, argued from changes in structural and perhaps functional usage of the site (MacKie 1974).

The hut site of Balevullin.

The material from the hut site of Balevullin (NGR NL 95 47) was excavated by A. Henderson Bishop during 1912 and subsequently deposited in the Hunterian Museum, Glasgow University. The account of the excavations and of the small finds recovered was not, however, published until 1963 (Mackie 1963) and consequently there is some doubt as to the exact context of the sherds and their cultural associations. Nevertheless it was possible to deduce that the main site represented some form of wooden hut and that the finds came from an occupation layer containing pottery, burnt stones and bones, which overlay a layer of pebbles, perhaps a

contemporary flooring (fig. 72). Other features within the structure included a possible hearth, two rubbish pits, a floor tank and a large stone anvil. Most of the sherds have no exact context and are known as coming from 'Balevullin general', these include such diverse pieces as mesolithic flints and the iron lock of a flintlock musket and represent Bishop's activities in the area over a number of years. On the hand some sherds are labelled as coming more specifically from 'No. 1 hut' and 'No. 2 hut' and these were believed by MacKie to be almost certainly derived from the 1912 excavations, though the identification of a site described as 'Croch hut' is not clear. The possible mixed nature of the sherds from this collection is demonstrated by the occurrence within the otherwise apparently prehistoric pottery assemblage of a piece of a clay pipe (Mackie 1963, 163, footnote 1).

Hut site 1.

The pottery known to have come from hut 1 consists of a spindle whorl (no. 12) and sherds from probably 8 different vessels, the majority of which would appear to have been thin walled urns (Fig. 73). No. 1 comprises 24 sherds from a vertical rimmed, bulging bodied pot. It is decorated with a horizontal row of impressed pits beneath the rim edge, with below this a double row of incised, continuous chevrons and below that again another horizontal row of circular impressions at the maximum girth of the vessel, these latter

perhaps having been formed by a hollow tube, possibly a bone. Sherd no. 2 seems to have come from a broadly similar vessel and is decorated with three rows of impressions of a hollow tube instrument. Sherds nos. 3 and 4 are plain rims from barrel or urn shaped vessels with the only other rim, no. 8, being slightly inturning with a row of finger tip impressions along the rim top. The remainder of the sherds display a variety of decorative techniques; one has a straight applied cordon slashed with vertical strokes (no. 5), another has a complex of lightly incised lines (no. 6) and the last has two arching broad channelled lines, perhaps made by a bunch of grass or other organic matter (no. 7).

Hut site 2.

Only two sherds are known to have come from the Balevullin hut 2 site, both are from basal angles. The sherds (nos. 18-19) appear to have come from thick walled urns of the storage jar type not dissimilar to the bucket shaped urns recovered from the pre- broch Epsilon deposits at Dun Mor Vaul (Mackie 1974, eg. fig. 11 nos. 11-12).

'Croch' hut site.

The pottery from the unidentified croch hut consists of 29 sherds but which only represent 6 vessels, including profiles of 3 rims and 1 base. Two of the rims (nos. 20 and 24) are from vessels which have been pulled up with an

internal bevel, in addition no. 24 has a decoration of faint broad brushed lines on the exterior. The other rim (no. 25) is from an urn and is inward curving with a top which has been impressed into small undulating notches by the potter's finger tips. No. 23 is the basal angle from a flat bottomed vessel whilst no. 21 displays a thin straight cordon which has been pinched up from the side of the original pot. The remaining vessel from the context was a small complete miniature pot which was made by impressing a digit into a small ball of malleable clay and though no traces of metallic slag can be seen, it may have originally been intended to have functioned as a metal working crucible.

Balevullin general.

The remainder of the pottery from Balevullin is of unknown context, and whilst most of it may be of later prehistoric date it should be emphasized the collection of other artefacts from this same context includes mesolithic and modern material. Broadly, however, the sherds from this general context would seem to have derived from several main vessel types (Fig. 74). The first are from small urns or vases (nos. 26-38) with an 'S' shaped profile, having everted lip rims (eg. nos. 26-27, 34-35), bulging bodies and which taper to a small footed base (nos. 26-27, 36-38). The decoration on these sherds consists largely of pinched up straight cordons which are either impressed by a small pointed object, or which have vertical and sloping slashes

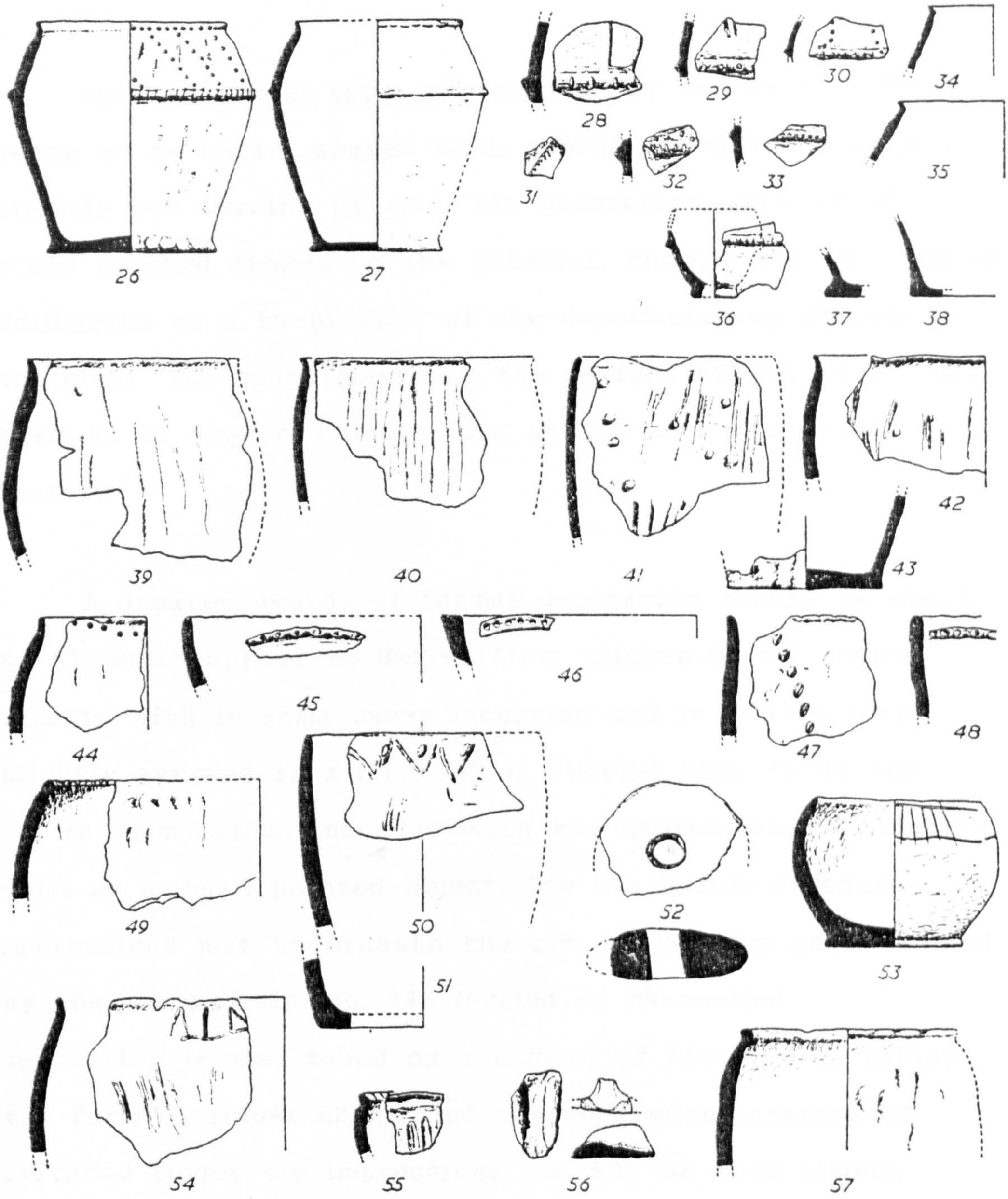


Fig. 74: Balevullin pottery. Scale 1:4 (after Mackie 1963).

on them (eg. nos. 28-39, 32-33).

Another vessel type, represented by sherds nos. 39-43, seems to be barrel shaped with a broad base and a plain or slightly out turning lip (Fig. 74). Decoration consists of broad brushed stokes on the exterior, though whether this is deliberate or a by-product of the manufacturing process is not clear. The round marks on the surface of nos. 41-42 also seem to be random indentations rather than a decorative feature

A greater degree of formal decoration occurs on sherds 44-57 which appear to derive from thicker barrel shaped vessels with in some cases incurving and in others very slightly everted rims (Fig. 74). In several (nos. 45-46 and 48) the rim top is indented with the impressions of finger nails or a small pointed object. One has a row of these impressions just underneath the rim, in the rim angle formed by the everted lip (no. 44). Incised or channelled decoration is also found on a number of the sherds, taking the form of finger channelled chevrons with interspaced indented finger tip impressions (no. 50), or more simply, channelled chevrons resting on top of a channelled horizontal line (no. 54). One of the remaining sherds in this general barrel shaped class displays a out turned rim with faint incised lines along the rim top and broad vertical channelled lines on the exterior beneath (no. 55). Vessel no. 53 has a very rounded profile and an unusual

decoration of a horizontal 'ladder' pattern just beneath the incurving rim. Another notable rim is on vessel no. 57 which is pinched into a roll or bead and has no parallels from the site. Sherd no. 56 is a lug or handle and is in all probability not of later prehistoric date.

The remainder of the pottery from the site belongs to a variety of larger and in many cases coarser vessels with thick bases (Fig. 75). Four possess cordons of some form, these are generally very thick and impressed with deep finger tip marks (eg. nos. 58-59 and 61) and of these no. 59 has a double cordons; most appear to be from vessels with incurving rims. One of the sherds is unusual (no. 60), because while stylistically it might be said to display a cordon, in actuality it does not, as instead of their being an applied or pinched up band of clay, the decoration consists of a horizontal row of deep finger tip impressions, thus giving the visual effect of a cordon in many ways akin to the others in this class. The rest of the vessels have a variety of rim types including out turned (eg. no 62), flat (eg. no. 64), inturned (eg. no. 68), bevelled (eg. no. 67) and flaring (eg. no. 71). Decoration is limited but in one instance consists of an applied ring of clay (no. 77), in another of finger tip impressions along the edge of the footed base (no. 70) and in a few of smoothing of the exterior (nos. 68 and 76).

In addition to the above collection of sherds and

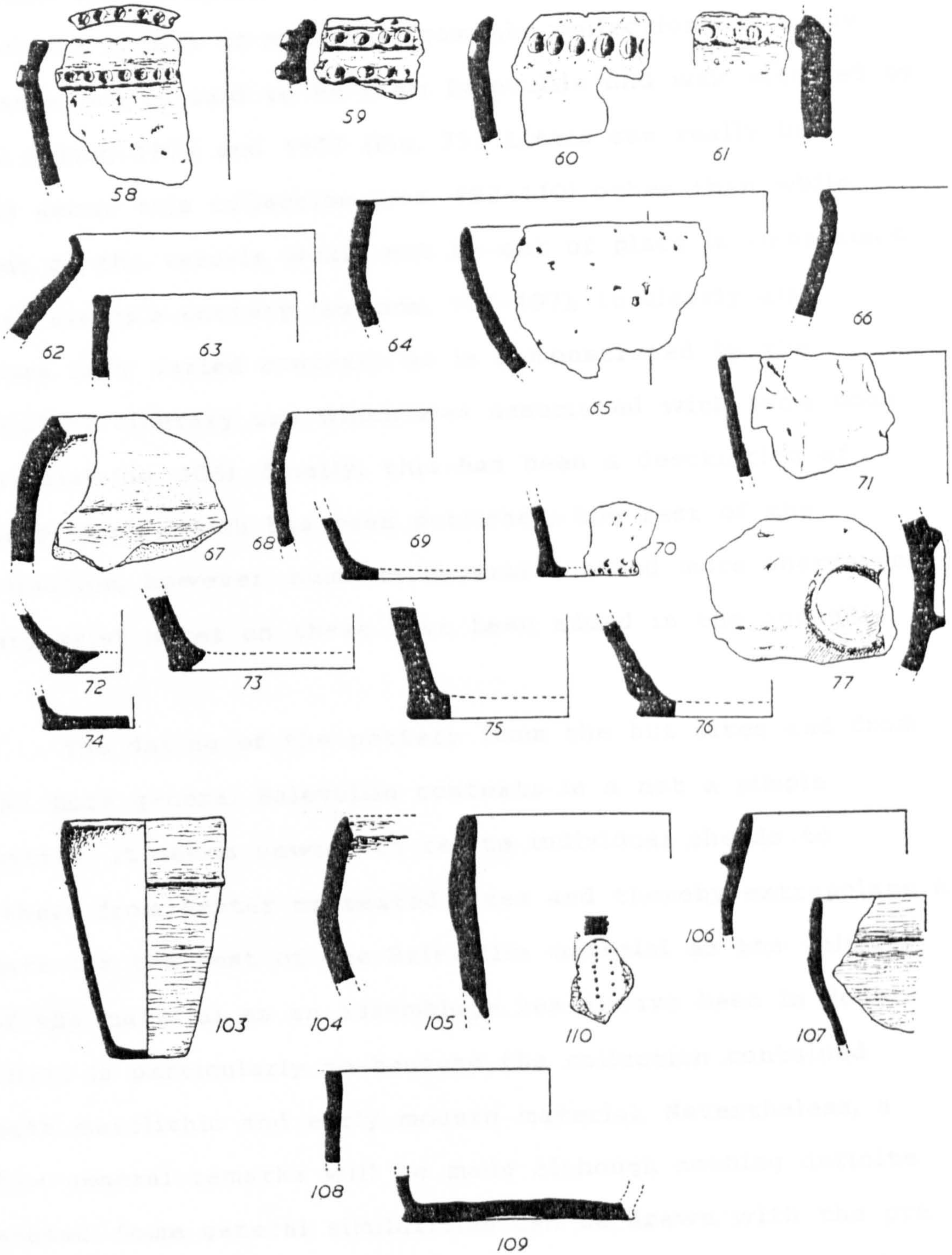


Fig. 75: Balevullin pottery. Scale 1:4 except no. 103 which is 1:12 (after Mackie 1963).

vessels from Bishop's 1912 excavations and field work there is also a corpus of material from the collections of Ludovic Mann which is said to be from Balevullin and was acquired by him during 1905 and 1907 (Fig. 75). Little can really be said about this collection (nos. 103-110) other than while some of the vessels would not be out of place in comparison with Bishop's pottery (eg. nos. 104-107), it clearly also comes from varied contexts as is demonstrated by the complete cinerary urn which was associated with some bone material (no. 103). Finally, this has been a description of the pottery which has been published, the rest of the collection, however, numbers several hundred more sherds and very brief notes on these have been added in the appendix.

The dating of the pottery from the hut sites and from the more general Balevullin contexts is a not a simple matter; it seems unwise to relate individual sherds to others from better contexted sites and thereby extrapolate a date for the rest of the Balevullin material as the validity of the material as an assemblage has always been in doubt. These is particularly so because the collection contained both mesolithic and early modern material. Nevertheless, a few general remarks will be made although nothing definite stated. Some general similarities can be drawn with the pre broch hut sites from Dun Mor Vaul, for example, the thick gritty pottery from Balevullin is not unlike the sherds of the bucket-shaped urns which were C^{14} dated to the 3rd-8th centuries BC. Other of the pottery such as the the

out turned lip vases from Balevullin (eg. nos. 39-40) also have similarities with the early midden material from Dun Mor Vaul. Thus some of the pottery, as MacKie noted may belong to this same general period (Mackie 1963, 176).

Some of the sherds display cordons, for example nos. 28-30 and 32-33, generally these are not of the type found at Dun Mor Vaul, as they seem to be pinched up rather than applied and display stab rather than fingertip or zigzag decoration, although sherd no. 248 from the latter's Iota context in the first centuries AD does come close. Other similarities can be noticed with some of the material from A Cheardach Bheag, South Uist (Fairhurst, 1971, eg. fig. 8 no. 5) and with Dun Cuier, Barra (Young, 1956, eg fig. 11 nos. 97-98) so the general early centuries AD date might have to be extended. In general there seems to be a danger of trying to reconstruct chronology from arefacts which are ultimately incapable of supporting such an approach. Equally the production of parallels from sites which could be of wide chronological and certainly geographical separation from the Hebrides intuitively risky, whilst to speculate movements of peoples from pottery is just that- speculation, as others have noted (Alcock, 1984, 15) Thus, while the material from Balevullin may belong to the general Later Prehistoric period, definition of any tighter dating is unjustified.

NAA results.

A total of 25 sherds from the varied contexts of the Balevullin assemblage were analysed by NAA. The results are shown in Fig. 76 and labelled by context in Fig. 77. Figs. 78-79 indicate that there are 4 clusters which are significantly different, although the dendrograms hint that sherds nos. 5 and 61 (NAA samples 201 and 202) are outliers to the main clusters. Fig. 77 shows that amongst the sherds analysed, no one context was identified as having vessels of a distinctive chemical composition. Given the mixed and uncertain nature of the assemblage as a whole, this is not totally unexpected. As with Dun Mor Vaul, the groupings indicated by the NAA are not matched by archaeological definitions of form or decoration. The sherds which comprise the individual clusters are summarized in Figs. 80-84 and no specific wares can be identified as being distinct within the assemblage. With hind sight the value of sampling such a miscellaneous collection of sherds may be seen to be limited.

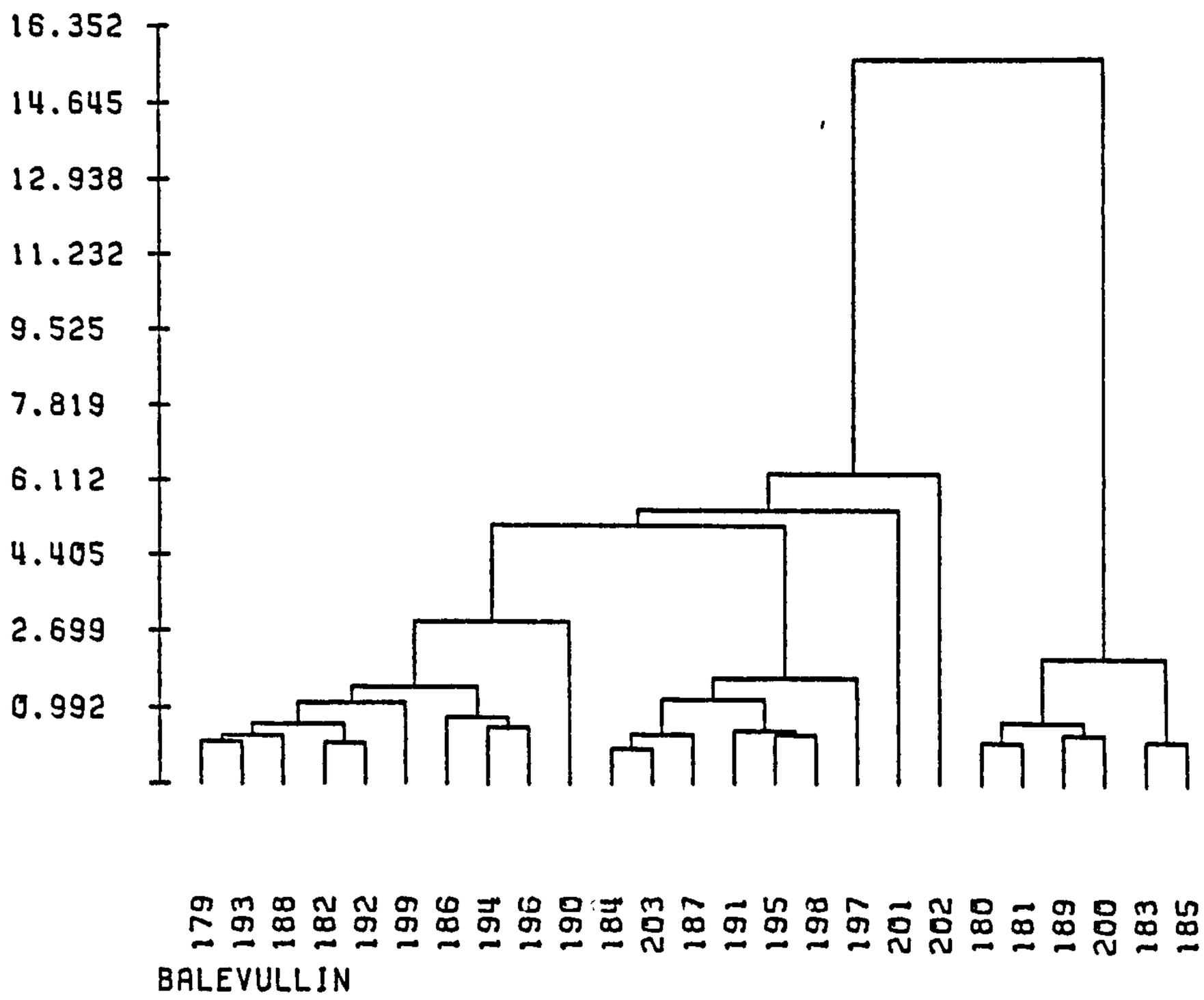


Fig. 76: Dendrogram of sampled sherds.

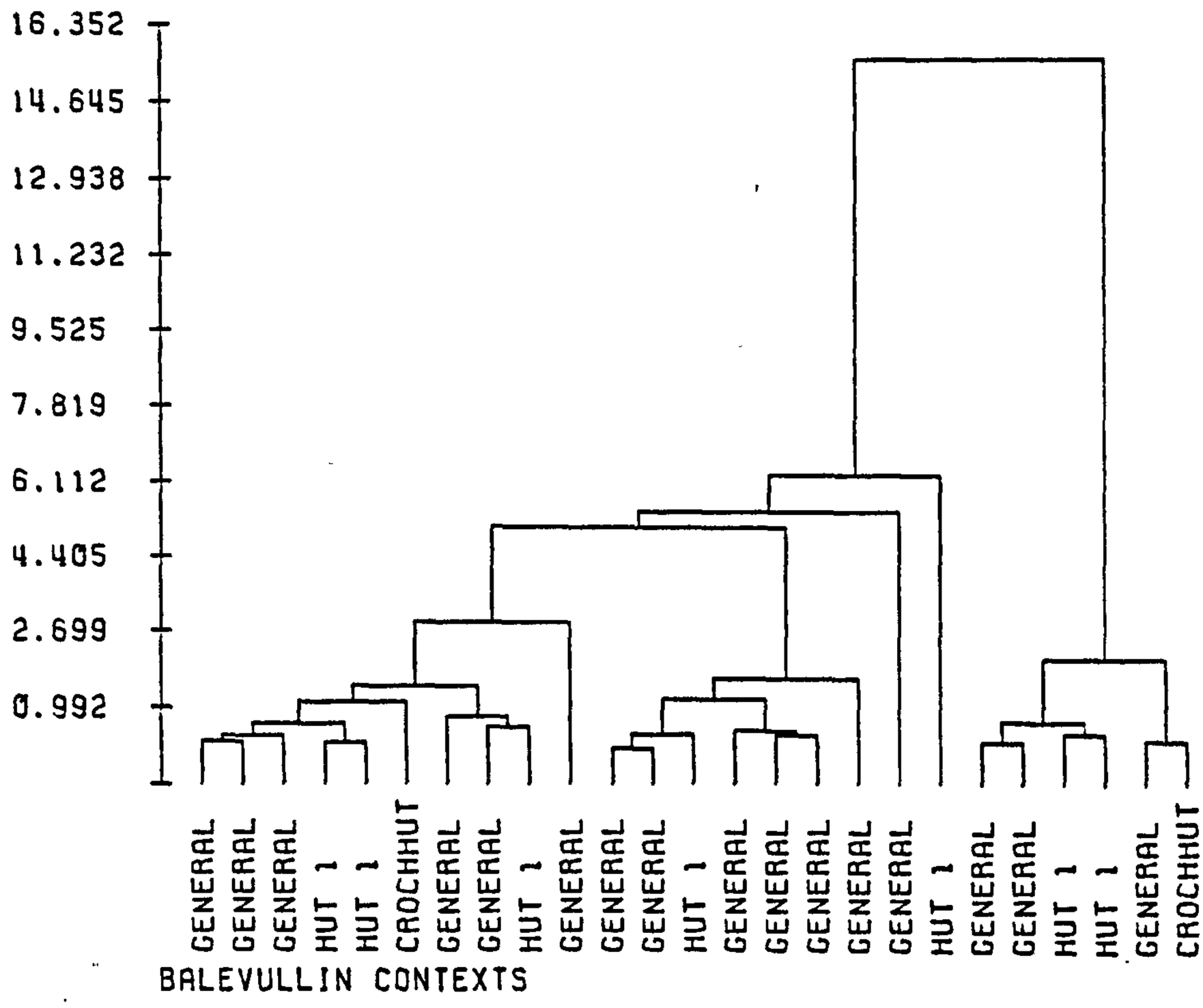


Fig. 77: Dendrogram of sampled sherds, labelled by context.

Balevullin

Cluster One: NAA samples 179, 193, 188, 182, 192, 199, 186, 194, 196 and 190. Cluster Two: NAA samples 184, 203, 187, 191, 195, 198 and possible outlier 190.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	75.1	60.4	85.4	4.4	83.9	2.8
Accept Null hypo.	Yes	Yes	Yes	No	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 78.

Balevullin

Cluster Three: NAA samples 180, 181, 189 and 200. Cluster Four: NAA samples 183 and 185.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	7.9	0.1	20.7	43.3	97.1	62.9
Accept Null hypo.	Yes	No	Yes	Yes	Yes	Yes

Null hypothesis: Cluster Three and Cluster Four come from the same population.

Fig. 79.

Balevullin: Cluster Number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
179	41	General	inturned	brush marked, barrel urn
193	26	General	out turned lip	hollow tube impressed dots, cordon deeply slashed
188	48	General	rounded	nail impressions on rim, brushed
182	3	1912 Hut 1	plain, lip out turned	thin walled urn or beaker
192	8	1912 hut 1	inturned	rim bevel has finger tip imprints barrel shaped urn
199	22	Croch hut	-------	complete minute vessel
186	44	General	out turned	rows of hollow tube impressed dots below the rim
194	77	General	-------	lug of clay with an applied clay ring
196	1	1912 hut 1	plain rim	row of impressed pits beneath the rim, zigzag lines and circular impressions, small urn
190	60	General	thin rim inturned	low cordon with shallow impressions, possible outlier

Fig. 80.

Balevullin: Cluster Number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
184	54	General	out turned lip	crude incised pattern below rim, brush marked
203	46	General	flat top	rim topped bone impressed, barrel
187	2	1912 hut 1	-------	three horizontal rows impressed dots
191	50	General	plain rim	crude zigzag grooves under rim, brush marked, barrel shaped
195	30	General	-------	cordon impressed with hollow tube small urn
198	32	General	-------	cordon slashed with hollow tube, small urn
197	59	General	inturning rounded	two thick finger tip impressed cordons, bucket shaped

Fig. 81.

Balevullin: Cluster Number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
180	28	General	-------	cordon with slashes, incision, small urn
181	29	General	-------	cordon impressed with hollow tube small urn
189	4	1912 hut 1	plain rim	thin walled urn or beaker
200	7	1912 hut 1	-------	channelled brush marks, thin urn or beaker

Fig. 82.

Balevullin: Cluster Number 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
183	65	General	tapering internal bevel	large bowl shaped vessel impressions under rim, brushed vertical lines
185	24	Croch hut		

Fig. 83.

Balevullin: Probable Outliers

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
201	61	General	-------	low cordon, shallowly impressed
202	5	1912 hut 1	-------	pinched up cordon with vertical slashes, thin urn or beaker

Fig. 84.

Chapter Five: Barra.

'There are several old Forts to be seen here, in form like those in the other Islands.' (Martin Martin 1716, 91).

Geological background.

The Isle of Barra is the southern most of the of the major islands of the Outer Hebrides, which cumulatively form the 'Long Island'. Barra in common with the rest of the chain has a geology predominantly dominated by Lewisian gneisses, though it differs from those to the north in having components of a more acid character including muscovite-biotite-gneiss and quartzo-feldspathic-gneiss (Phemister 1948, 11). The island was geologically mapped in the 1920's (Jehu and Craig, 1923) but subsequent work has only tended to concentrate on individual areas of interest so that the cover is unbalanced, this will hopefully be rectified with the publication of the Geological Survey's recent work on the whole of the Outer Hebrides (Smith and Fettes 1979, 75). On Barra itself the orthogneisses are occasionally penetrated by bands of hornblende-granulite and pyroxene-granulite, which in some areas are themselves cut into by pink and grey pegmatites. These latter have a varied composition with some consisting of albite-oligioclase, microcline, quartz, biotite, pyroxene and orthite (Peach and Horne 1930, 60). Another remarkable feature of Barra is the effect of dynamic metamorphism, which has led to great crushing of the rock, in particular this is well developed

at Cuier.

Two samples of clay were recovered from the island, one of the sources of these was thought by the excavator to have been utilised in the the construction of the farm house at Tigh Talamhanta, Allasdale (Young 1953, 81-83). This may be the case, however, the high chromium levels in the order of over one thousand parts per million in a sample taken from one of the stream banks, demonstrates that this certainly was not the source of clay used in pottery production, as no sherd approached these levels in the NAA analysis. The stream bank clay contained the minerals, albite, montmorillonite, diopside and possibly halloysite. The last is akin to kaolinite, whilst the second is a clay mineral, and although prone to shrinkage, means that this source had potential for being used for pottery production, although as indicated by the analysis it was not. The existence of diopside, is perhaps not unusual given the solid geology of the island, as it can occur at the boundary of gneisses and metasediments (Drury, 1974, 242) after metamorphism; the Outer Hebrides Thrust Plane passes almost through the site of Tigh Talamhanta (Smith and Fettes, 1979, fig. 3).

The other clay to be sampled was one similar to that described as the possible source of a small proportion of the pottery from Dun Cuier. The excavator cited that such clay could be obtained at the foot of Ben Mhartin (Young 1956, 304), in fact it occurs widely on the lower ground

between the hills, and samples were taken from an exposed bed on the southern side of Ben Cliad 1000 metres away. The X-ray diffraction analysis demonstrated that the major minerals in this sample were albite, tremolite, quartz, chlorite, kaolinite, muscovite, montmorillonite and potassium feldspar, potentially a reasonable potting clay and quite possibly used by the Later Prehistoric population.

History of archaeological investigation

In relation to the Uists, Barra has received only scan archaeological attention, with early records only recording the finding of brooches of varying dates (Mackintosh 1910, 218; Curle 1914, 307-308). The prehistoric sites on the island were, however, examined by surveyors for the Royal Commission of Ancient and Historical Monuments, and the ensuing inventory published in 1928. This indicated the presence of a number of defensive constructions, variously described as brochs, probable brochs, galleried duns and duns, of which Dun Cuier was labelled as belonging to the first class. An examination of the inventory demonstrates that these and all the other structures, bar the castles of Kiessimul and Sinclair, were surveyed in a period of ten days, between the 5th and 15th June 1915. In consequence, detailed accurate descriptions of the sites should neither be assumed or indeed expected.

The site of Tigh Talamhanta.

The first site to be excavated with any thoroughness on Barra was the aisled farm house known as Tigh Talamhanta (in Gallic the 'the house under the ground'), in the townland of Allasdale. Initial work was begun by Sir Lindsay Scott in 1950 and following his death, was continued by Miss Alison Young who published the report of the excavation in 1953. In part perhaps owing to lack of continuity of director, much of the pottery cannot be ascribed to an exact context, which is unfortunate as the site was clearly multiphase with use continuing sporadically into the modern period. The settlement consisted of a farming complex with an aisled wheelhouse, souterrain, kilnhouse, working area and a byre and barn; the whole situated within one and half acres enclosed by a wall. Such a combination of well defined structures is unusual amongst later prehistoric sites in the west, although a site which provides a parallel is Clettraval on North Uist. Other complex sites have been investigated in the Hebrides, for example Foshigarry also on North Uist, but the relationship of one structure to another at these has never been satisfactorily demonstrated, indeed at Tigh Talamhanta itself, there is some room for doubt as to whether the whole site is actually coeval.

The wheelhouse, linked to the souterrain, is reckoned to have undergone two major phases of occupation with the second being delineated by a rebuilding and strengthening of

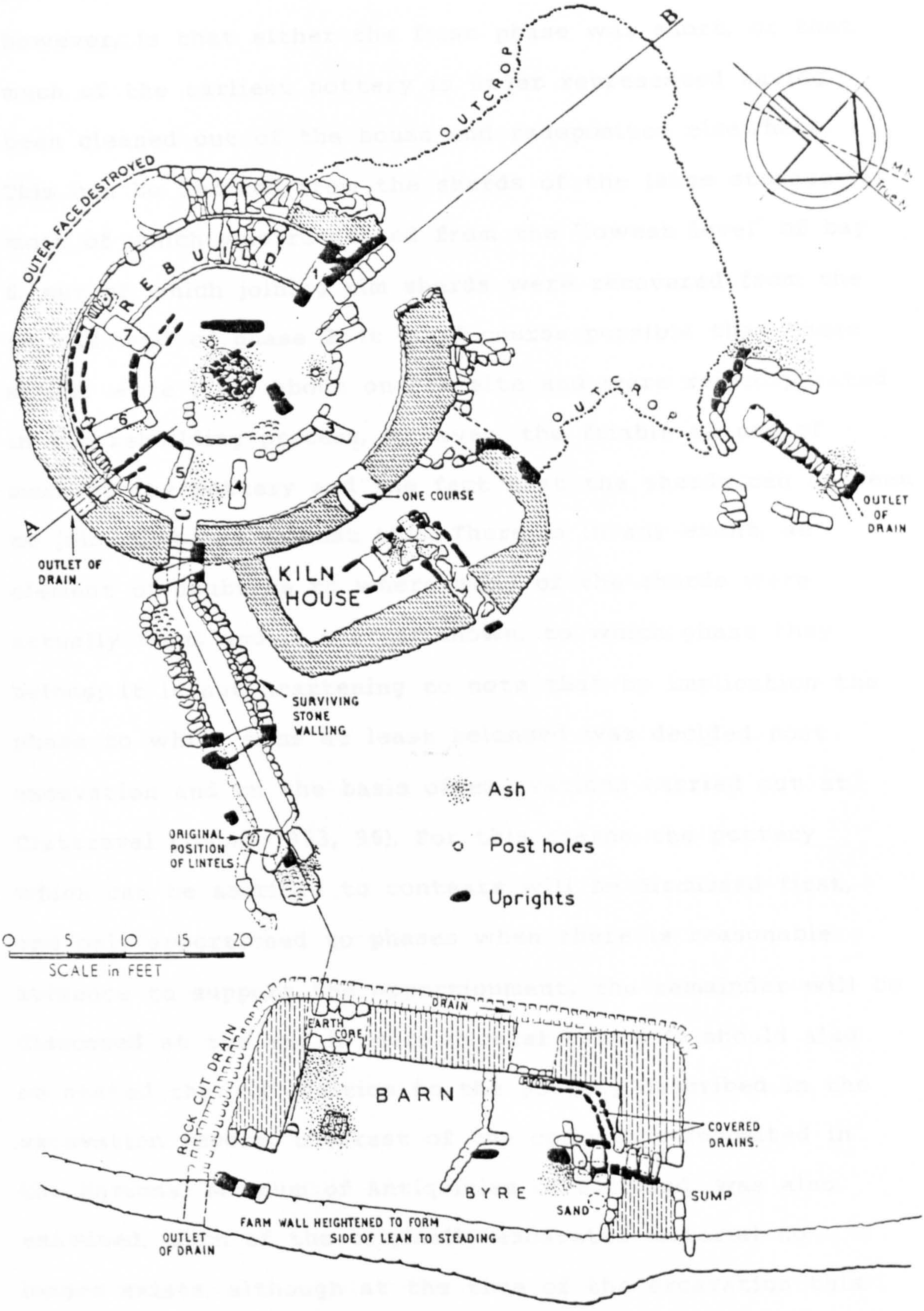


Fig. 85: Tigh Talamhanta site plan (after Young 1953).

part of the outer wall. What is apparent from the pottery, however, is that either the first phase was short, or that much of the earliest pottery is under represented having been cleaned out of the house and redeposited elsewhere. This can be deduced from the sherds of the large storage jar most of which was recovered from the 'lowest level' of bay 6, but of which joining rim sherds were recovered from the rebuild wall of phase 2. It is of course possible that these sherds were lying about on the site and were reincorporated in the rebuilding process, however, the friable nature of much of the pottery and the fact that the sherds can be seen to join militates against this. There is in any event, an element of doubt as to where many of the sherds were actually from, and if that is known, to which phase they belong; it is not heartening to note that by implication the phase to which some at least belonged was decided post excavation and on the basis of excavations carried out at Clettraval (Young 1953, 96). For this reason the pottery which can be ascribed to contexts will be discussed first, and only apportioned to phases when there is reasonable evidence to support the apportionment, the remainder will be discussed at the end in more general terms. It should also be stated that in addition to the pottery described in the excavation report, the rest of the collection deposited in the National Museum of Antiquities of Scotland, was also examined. Much of the originally excavated material no longer exists, although at the time of the excavation this included over half a hundredweight of sherds.

The hearth.

Four contexts can be identified within the wheelhouse itself, the hearth, the central area, the rebuild and finally specific bays within the structure (pottery Figs. 86-90). The hearth was in the centre of the farm house structure, which was 36' in diameter and roughly circular in plan (Fig. 85). In phase 1 the burnt area was roughly oval in plan and was delimited on the western side by slab paving and on the eastern by roughly set stones. Two vessels are ascribed as deriving from it, nos. 8 and 14. The 28 sherds of no. 8 are from an everted rim pot, as is that from no. 14, although this latter is much thicker and outward curving. It has a very burnt outer surface and an abraded exterior, and thought to be of a different fabric to the rest of the assemblage by the excavator (Ibid, 90). In phase 2 the hearth was rebuilt, becoming square paved with chamfered stones being set along three sides. Sherds from a further four vessels were recovered from this context; nos. 15, 29, 30 and 56. Sherds no. 15 are from a globular vessel with a rounded upright rim and decoration consisting of an applied wavy cordon along the shoulder (Ibid, fig. 5 no. 15). No. 29 has a rounded, almost rolled rim, with in addition a row of fingertip depressions in the neck angle. No. 30 has no well defined rim, though in practice it would be described as rounded and slightly pressed out. The fourth sherd, no. 56, is of a different character, being a small

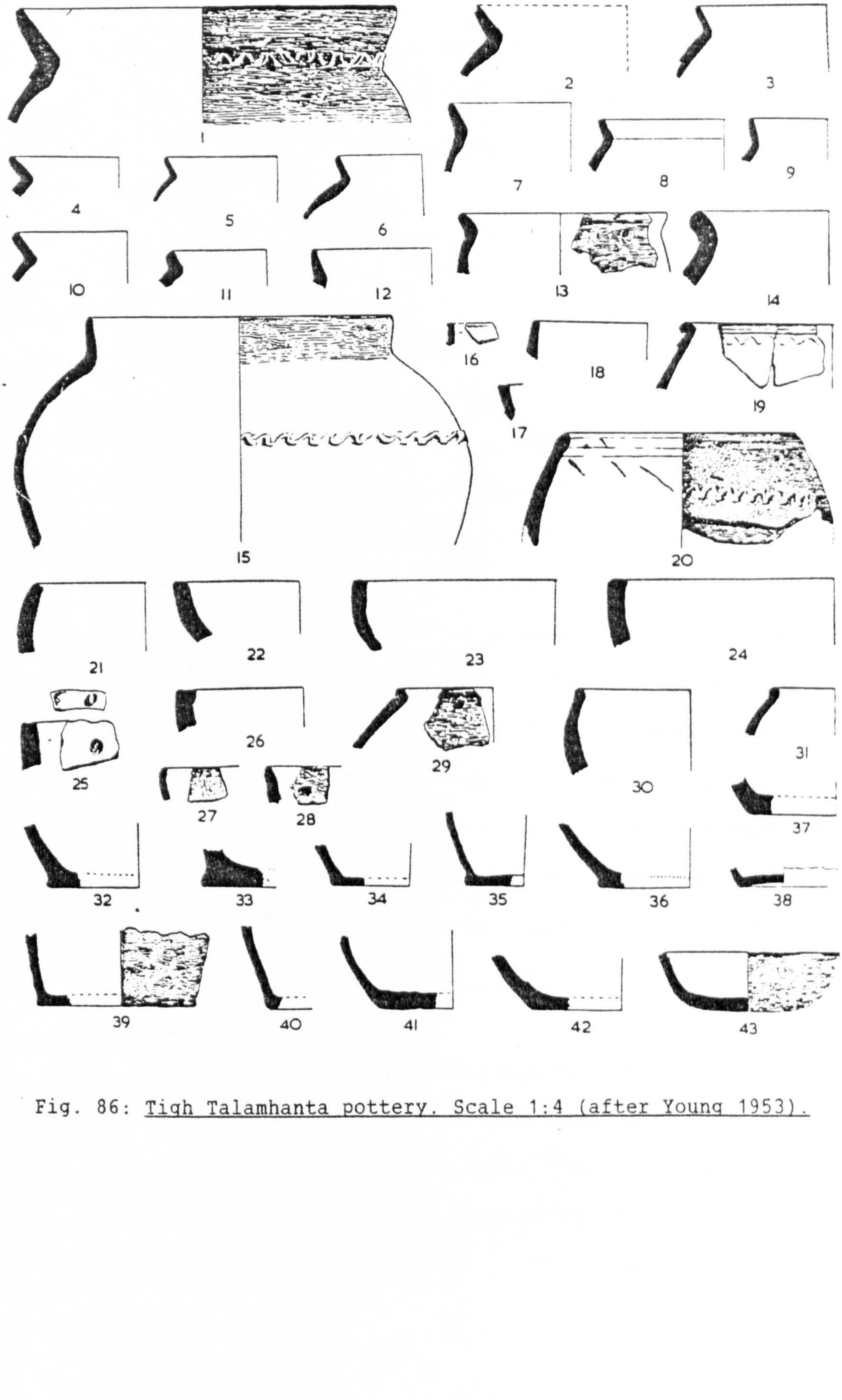


Fig. 86: Tigh Talamhanta pottery. Scale 1:4 (after Young 1953).

sherd with an obliquely slashed cordon. Also from the hearth, but of unknown phase, was no. 66 which displayed a horizontal, incised chevron pattern with short vertical strokes; it is unfortunate that this could not be located at the time of examination of the rest of the material.

The central area.

The central area contained sherds which can be ascribed to phases 1 and 2, although the majority cannot be located with any certainty. From phase 1 were nos. 12 and 93, the former having an almost vertical, although slightly concave rim. The latter was one of the more unusual vessels from the site, consisting of 6 sherds of revealing a rounded rim with an angular shoulder reminiscent of a metal prototype (Ibid, 96). From phase 2 were nos. 47, 52, 57, 58 and 60; all bore cordons of varying types. No. 47 was of the common wavy type, with those of nos. 52, 57 and 58 being applied and then moulded with the fingertips to give a chain effect, or in the case of no. 57 a 'pillow' motif. No. 60 had a cordon composed of close set short oblique slashes, not unlike that from the phase 2 hearth (no. 56).

The remainder of the sherds from the central area, comprising 2 rims, 3 bases and 5 decorated wall sherds, collectively form the majority in not being assignable to any specific phase. The rims are one which is unusual being small and upright with a concave rim edge (no. 17), and the

other which is slightly out turned with beneath a brushed surface, in parts stamped with a semi circular pattern made with part of a bone or a hollow reed (no. 84). The bases, nos. 35, 37 and 42, are from several vessels. Of the decorated sherds, no. 68 displays a plain cordon slashed with short vertical nicks and has part of a possible lattice pattern above. Sherd no. 70 has the remains of the lower parts of incised chevrons or triangles, but the main part of the decoration is now broken off and missing. The remainder, nos. 71, 73-74, exhibit cordons of varying types, with finger moulding as well as punching with a small object to give a chain effect. The cordon on no. 71 is visual rather than actual being composed of short diagonal incised lines, and like the others there are remnants of an incised pattern of some form above; it may be part of sherd no. 64.

Area of rebuild.

Within the wheelhouse another context was identified as being an area of rebuild, with the major part of the work being the construction of a reinforcing wall running from pier 7 to the entrance. Pottery which was assignable to both phase 1 and 2 of the site's occupation was recovered and totalled some 12 still extant sherds. Of these 5 were described as phase 1, and included parts of the rim from the large storage vessel with the everted rim and cordon in the neck (no. 1) of which other pieces were found in the lowest levels of bay 6. Other sherds from phase 1 included nos.

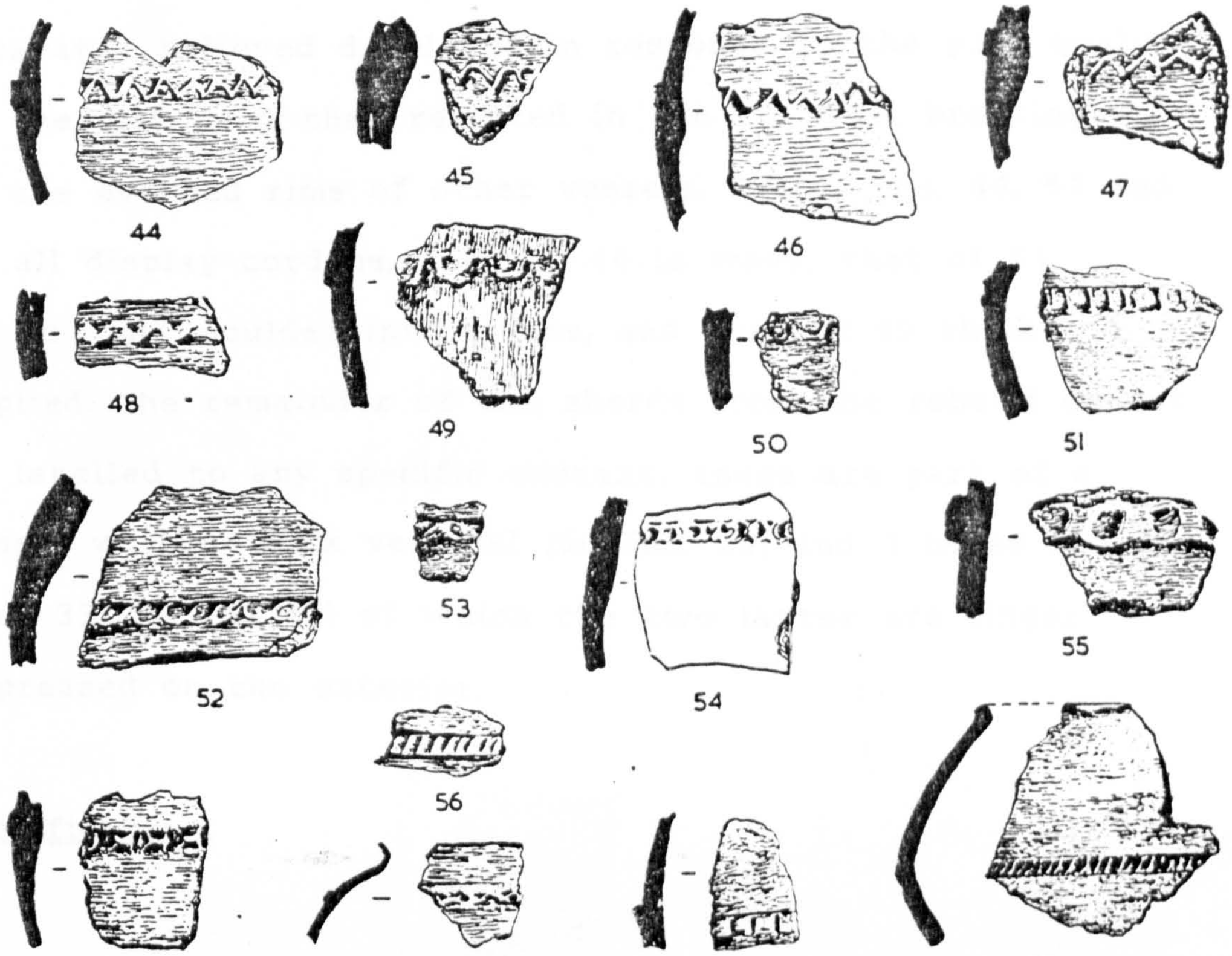


Fig. 87: Tigh Talamhanta pottery. Scale 1:3 (after Young 1953).

3-4, 6 and 9, all of which were everted rims and appear to have derived from storage jars. Of the sherds 4 can be accredited to phase 2. No. 30 is part of a bowl with a rounded, pressed out, almost rolled rim, a type which the excavator believed developed in response to the poor quality of the clay used that resulted in the frequent breaking off of the everted rims of other vessels. Sherds nos. 44, 51 and 99 all display cordons, that of 44 is wavy, that of 51 applied and moulded into ridges, and that of 99 thick and applied. The remainder of the sherds from the rebuild cannot be labelled to any specific context, these are part of a vessel with a thick vertical rim (no. 26) and 3 bases sherds (nos. 33, 39 and 41) of which the two latter are finger impressed on the exterior.

Specific bays.

Only a very few of the sherds are identifiable as coming from a specific bay within the wheelhouse itself. From bay 2 are sherds nos. 34, in total 73 base sherds from a flat bottomed vessel and from the same bay in phase 2 comes sherd no. 19 which seems different in visual appearance to the rest of the assemblage and which has a rolled over rim with an applied wavy line just beneath. From bay 3/4 came another base, this time saucer shaped and from an open bowl. Also from this bay were a cordoned sherd with a single arching finger channelled line above (no. 85), in some reminiscent of 'Clettraval' ware and a base sherd which

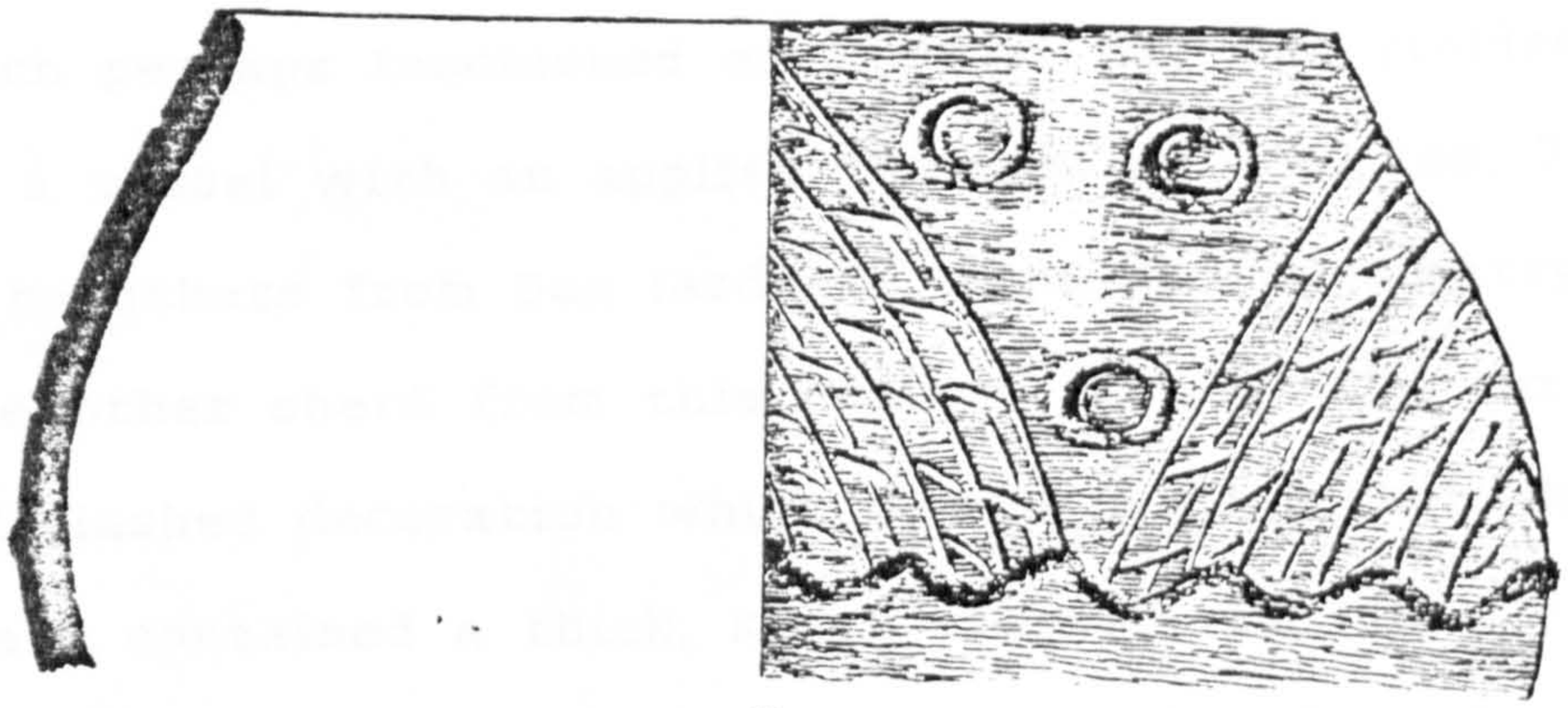


Fig. 88: Tigh Talamhanta pottery. Scale 1:2 (after Young 1953).

had been perforated with three holes after firing (no. 92), and which perhaps functioned as a sieve. Bay 4/5 yielded part of a vessel with an applied thumbed up boss (no. 75), similar to others from Dun Iardhard, Skye and Foshigarry, N. Uist. The other sherd from this context (no. 81) had curved lines of slashed decoration which give a cable effect. Bay 5 in phase 1 contained a thick, short everted rim (no. 11) and from bay 6 came parts of the large everted and cordoned rim storage jar (no. 1), from which rim sherds were also recovered in the rebuild join.

The souterrain.

A variety of sherds were recovered from the souterrain, which was an original part of the wheelhouse complex and which opened into it between bays 4 and 5. From phase 1 were recovered parts of several everted rim vessels (no. 10), of which one had a thumbed neck (no. 13). Sherds recovered in the second phase included one with an applied wavy cordon (no. 48) and another which was unique to the site having a worn applied cordon which was decorated with strokes made by a blunt point, it came from the souterrain's upper chamber. In addition to these 4 sherds a further group, although from the same general context, cannot be assigned to any particular phase. Of these there is one rim from a bowl which exhibits fingertip and nail marks along the top of the rim, as well as along the sides just beneath (no. 25). Sherd no. 27 is either from the rim of a bowl, or is part of a

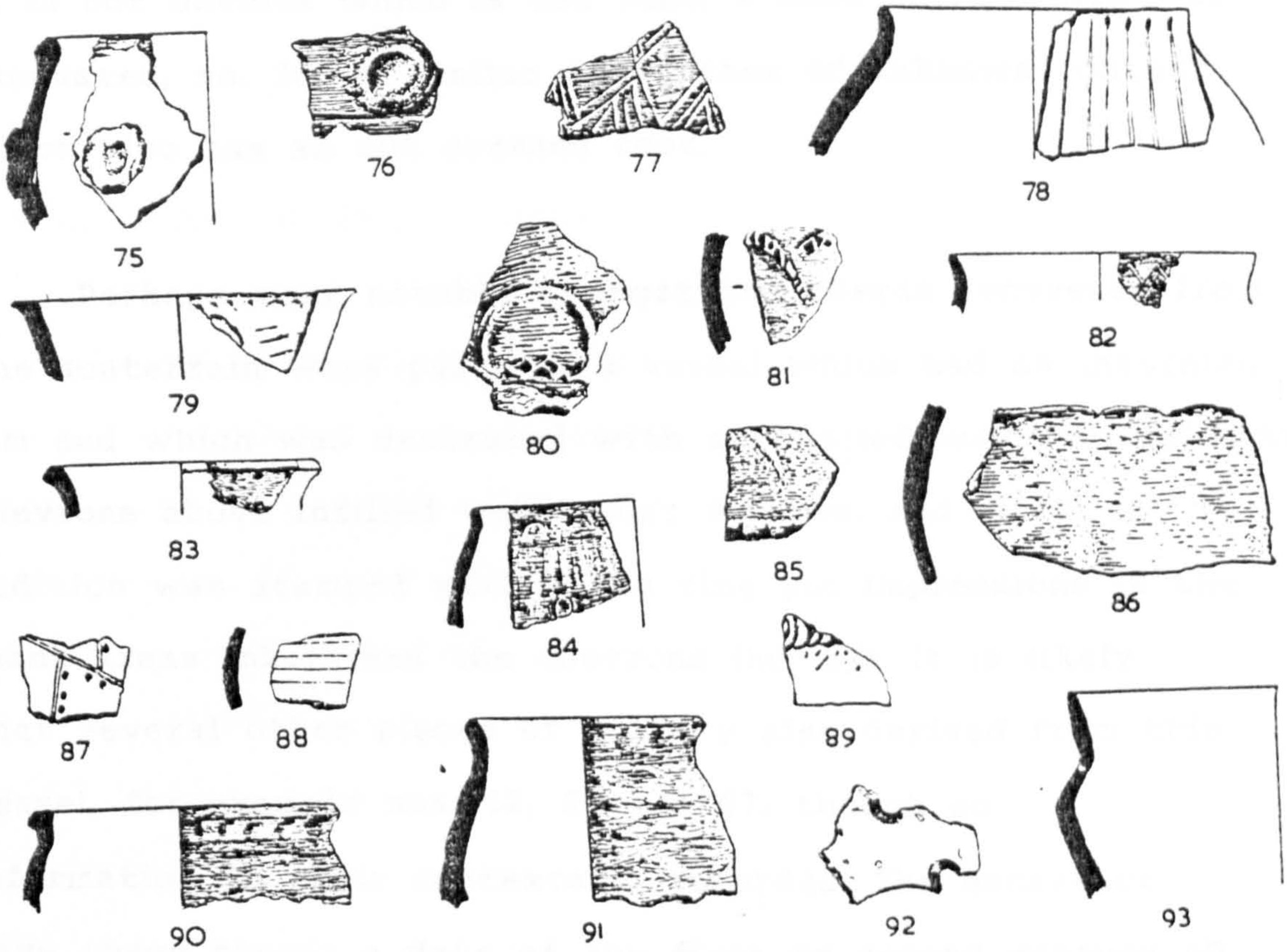


Fig. 89: Tigh Talamhanta pottery. Scale 1:3 (after Young 1953).

Fig. 90: Tigh Talamhanta clay moulds. Scale 1:4 (after Young 1953).

ring built vessel which has broken along the building join, it is not obvious which is the case. A base sherd which was excavated, no. 36, is similar to another of unknown context which also has an out pressed foot.

Perhaps most notable amongst the sherds recovered from the souterrain were parts of a vessel which had an inturning rim and which was decorated with an applied wavy cordon with chevrons above infilled with short strokes, and which in addition was stamped with three ring pin impressions in the blank areas inbetween the chevrons (no. 61). It is likely that several other pieces of pottery also derived from this vessel, for example nos. 62, 65 and 67, though no information on their contexts is recorded. The excavator gave these sherds a date of the first to second century AD on the basis of the recovery of shouldered pins from Traprain Law and other sites, although it is now clear from other sites, such as Dun Mor Vaul, that pin stamping as a decorative technique can have a much earlier date. Three other sherds from the souterrain also deserve attention, these are nos. 76, 86 and 90. Sherd no. 76 displays an applied thumbed up boss, with a single horizontal channelled line beneath and has parallels with no. 75 from Tigh Talamhanta and a sherd from Dun Iardhard, Skye. One sherd (no. 86) has a few similarities with 'Clettraval' ware with finger channelling and a slashed cordon, although it is not as finely executed as the sherds from that site. Sherd no. 90 has an out turned, rounded rim with finger tip

impressions in a row in the neck, with a certain likeness to sherds from Dun Iardhard, Skye and from Dun Cul Bhuirg, Iona.

Sherds from unknown contexts.

Sherds of no known context or phase include no. 64 which has a slashed and applied cordon with incised chevrons above, also with incised chevrons are no. 69 a fragmentary piece and no. 72 with the parts of the chevrons being delineated with two thin parallel incised lines. No. 78 is part of an out turning rim with stab and drag marks below, no. 79 is very unusual, having a straight sided, outward flaring rim with a flat top and thumb marks just below. Sherd no. 80 has an applied, moulded cordon with an applied almost circular ring of clay above, no. 87 has a pattern of incised lines and impressed dots and is without parallel on the site, although similar sherds come from other sites, no. 88 was thought to be made by the use of a slow wheel and was regularly ribbed and has parallels from other sites, for example Dun Mor Vaul, Tiree (MacKie, 1974, fig. 18 nos. 372-374). A number of sherds not described in the site report, are included in the appendix relating to this site (nos. 95-125), most have little decoration and are also of unknown context and phase. In addition to the pottery, 10 pieces of clay moulds were recovered (no. 94), mainly from the central wheelhouse area. Most are so fragmentary that the nature of the object being cast is uncertain, although

it was perhaps a pin of some form.

Chronology

As with so many of the Western Islands sites, Tigh Talamhanta can only be dated by tenuous analogy of several of the recovered objects. Of most value are probably the 3 small yellow annular beads, of which one was recovered from the ash in the rebuild wall. As for the other sites a general date in the late centuries BC or early centuries AD may be suggested (Guido, 1978, 76). The fragment of metal recovered from the base of pier 4 (Young 1953, fig. 9 no. 1) is perhaps a brooch but is not entirely convincing. The ring pin stamped sherds were dated to the first to second centuries AD by analogy with pins from Traprain Law, however, such pins and their use in this function has a much wider possible chronological horizon as discussed in chapter three. Furthermore the date ascribed to he site by Alison Young was based on the pottery sequences from Clettraval, these are themselves open to question and so the matter of chronology for Tigh Talamhanta is unresolved.

NAA results.

A total of 50 samples were analysed from Tigh Talamhanta pottery sherds and the dendrogram which was produced is shown in Fig. 91 with labelling by phase and context in Fig. 92. Figs. 93-97 indicate that there were 7

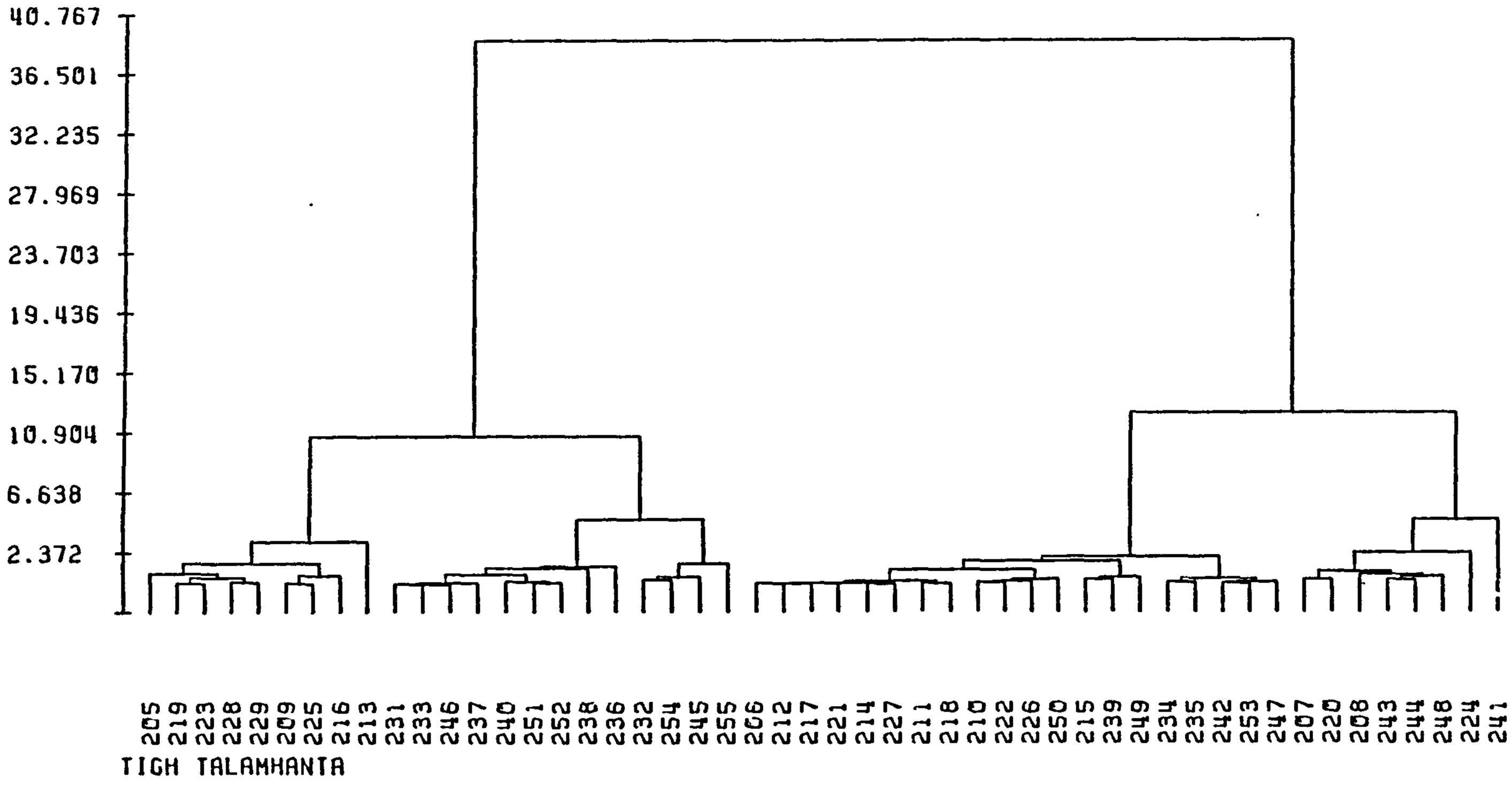


Fig. 91: Dendrogram of sampled sherds.

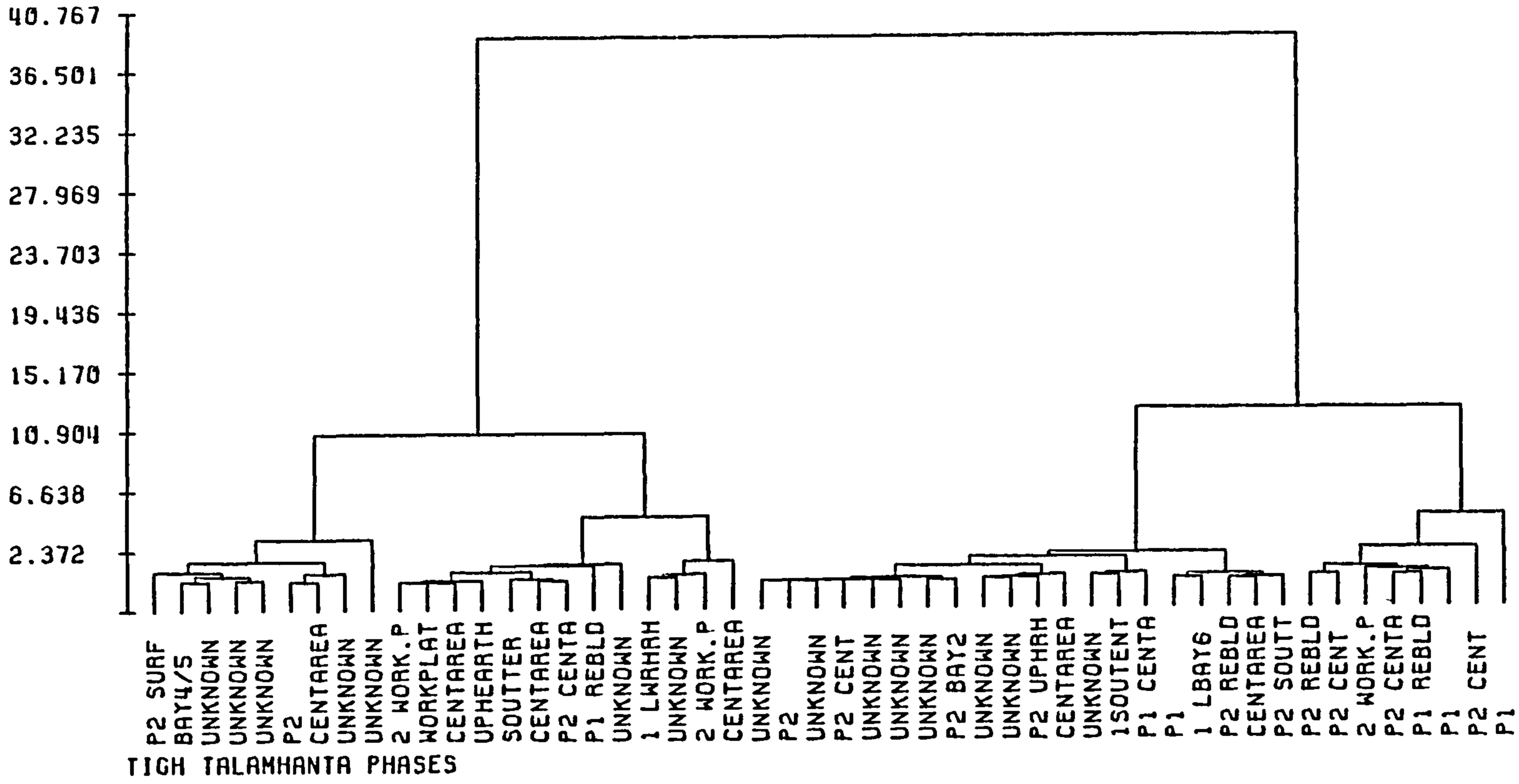


Fig. 92: Dendrogram of sampled sherds, labelled by context.

Tigh Talamhanta

Cluster One: NAA samples 205, 218, 223, 228, 229, 209, 225, 216 and 213. Next nearest grouping 231.....255 (total 13).

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	13.9	<0.0	42.4	13.8	44.0	0.7
Accept Null hypo.	Yes	No	Yes	Yes	Yes	No

Null hypothesis: Cluster One and the next nearest grouping come from the same population.

Fig. 93.

Tigh Talamhanta

Cluster Two: NAA samples 231, 233, 246, 237, 240, 251, 252, 238 and 236. Cluster Three: NAA samples 292, 254, 245 and 255.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	<0.0	0.6	<0.0	54.5	7.3	48.8
Accept Null hypo.	No	No	No	Yes	Yes	Yes

Null hypothesis: Cluster Two and Cluster Three come from the same population.

Fig. 94.

Tigh Talamhanta

Cluster Four: NAA samples 206, 212, 217, 221, 214, 227, 211, 218, 210, 222, 226 and 250.
Cluster Five: NAA samples 215, 239 and 249.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	26.5	24.1	35.9	6.3	74.6	4.6
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	No

Null hypothesis: Cluster Four and Cluster Five come from the same population.

Fig. 95.

Tigh Talamhanta

Cluster Four and Cluster Five: NAA samples 206, 212, 217, 221, 214, 227, 211, 218, 210, 222, 226, 250, 215, 239 and 249. Cluster Six: NAA samples 234, 235, 242, 253 and 247.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	1.0	<0.0	7.7	1.4	14.4	6.6
Accept Null hypo.	No	No	Yes	No	Yes	Yes

Null hypothesis: Cluster Four and Cluster Five come from the same population as Cluster Six.

Fig. 96.

Tigh Talamhanta

Cluster Four, Cluster Five and Cluster Six: NAA samples 206, 212, 217, 221, 214, 227, 211, 218, 210, 222, 226, 250, 215, 239, 249, 234, 235, 242, 253 and 247. Cluster Seven: NAA samples 207, 220, 208, 243, 244, 248, 224 and 241.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	56.4	55.5	48.9	<0.0	0.8	<0.0
Accept Null hypo.	Yes	Yes	Yes	No	No	No

Null hypothesis: Cluster Four, Cluster Five and Cluster Six come from the same population as Cluster Seven.

Fig. 97.

Tigh Talamhanta: Cluster number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
205	46	P2 surface	-------	ring join, applied wavy cordon
218	19	P2 Bay 2	rolled over	cordon just below rim
223	82	Unknown	everted	sharply incised triangular pattern with impressed dots
228	87	Unknown	-------	punched pattern, incised lines
229	69	Unknown	-------	feathered lines and incised chevrons
209	49	P2	-------	coarse applied wavy cordon
225	84	Central area	plain	stamped semi circular pattern made with a hollow bone or reed
216	77	Unknown	-------	traces of an applied cordon and haphazard chevron pattern
213	79	Unknown	projecting and flat	poor incised pattern, thumbed along rim top

Fig. 98.

Tigh Talamhanta: Cluster number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
231	22	P2 work. plat.	square	----------
233	24	P? work. plat.	square	----------
246	70	P? cent. area	-------	incised pattern of triangles
237	29	P? upp. hearth	thumbed	row of depressions beneath rim
240	25	P? soutterain	vertical	finger and nail impressions on top, of and below rim
251	17	P? cent. area	upright, concave	----------
252	52	P2 cent. area	-------	finger tip decoration on cordon
238	9	P1? rebuild	everted	----------
236	124	Unknown	everted	applied wavy cordon in neck

Fig. 99.

Tigh Talamhanta: Cluster number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
232	14	P1 low. hearth	everted	incised lines on body
254	32	P? soutterain	-------	outpressed base, brushed surface
245	21	P2 work. plat.	slightly inturned	----------
255	73	P? cent. area	-------	finger pressed applied cordon, incised criss cross pattern

Fig. 100.

Tigh Talamhanta: Cluster number 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
206	81	Unknown	-------	cordon effect given by curved line of slashed decoration
212	50	P2	-------	coarse applied wavy cordon
217	78	Unknown	vertical	stab and drag in vertical lines
221	57	P2 cent. area	-------	applied cordons pressed into pillow motifs
214	80	Unknown	-------	cordon in a chain effect, raised semi circle above
227	65	Unknown	-------	incised triangles alternately hatched or infilled with triple ring pin stamps
211	94	Unknown	-------	metal working mould fragments
218	19	P2 Bay 2	rolled over	cordon just below rim
210	64	Unknown	-------	applied cordon, incised feather pattern and triangles
222	72	Unknown	-------	clay pressed up to form a cordon and finger nail slashed, faint incised chevron
226	56	P2 upp. hearth	-------	applied cordon slashed obliquely
250	74	P? cent. area	-------	clay pushed up to form a cordon punched with a blunt point, incised feather and ribbon

Fig. 101.

Tigh Talamhanta: Cluster number 5

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
215	63	Unknown	-------	incised feather and chevrons
239	10	P1 sout. ent.	everted	----------
249	12	P1 cent. area	upright, concave	finger pressed on outside edge

Fig. 102.

Tigh Talamhanta: Cluster number 6

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
234	7	P1	everted	----------
235	1	P1 low. level Bay 6 + rebld	everted	applied cordon in neck angle
242	44	P2 rebuild	-------	fine applied cordon over join
253	42	cent. area	-------	base sherd
247	48	P2 soutterain	-------	applied wavy cordon

Fig. 103.

Tigh Talamhanta: Cluster number 7

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
207	51	P2 rebuild near entrance	-------	finger pressed applied cordon pinched into ridges
220	60	P2 cent. area	slightly everted	slipped outer surface with slashed cordon
208	45	P2 work. plat.	-------	fine applied cordon over join
243	47	P2 cent. area	-------	applied wavy cordon, join finger pressed
244	3	P1 rebuild	everted	surface smoothed
248	2	P1	everted	surface brush marked
224	58	P2 cent. area	thin and everted	chain effect given by pattern applied with a blunt tool
241	5	P1	sharply everted	----------

Fig. 104.

statistically significant clusters and the details of these are contained in Figs. 98-104. No recurring archaeological pattern is visible within the chemically defined clusters and thus it is not possible to define which if any of the vessels were imported to the site or if clay sources and manufacturing techniques underwent change through time. It can be stated, however, that the pottery was not produced from the clays which occurred along the stream beds close to the site, as the analysis of this raw material indicated chromium levels many times higher than that found in any sherd.

<u>The site of Dun Cuier.</u>

During the last year of work at Tigh Talamhanta, preliminary excavation was also undertaken at the defended site of Dun Cuier, one mile to the west. The site lies on the eastern end of a rocky ridge of outcropping Lewisian gneiss and before excavation consisted of a grass covered stone mound. The early stages of excavation revealed that the site had been reoccupied in the recent period, with intrusive walling being associated with artefacts of probable 18th century date (Fig. 112). The later prehistoric phase consisted of a small, almost circular stone fort, belonging to the general class known as 'dun', though the terminology is applied more for traditional than archaeological reasons. The fort was comprised of three walls; an outer some some 6'6" thick, the main wall of carefully built solid masonary varying between 4' and 6' in

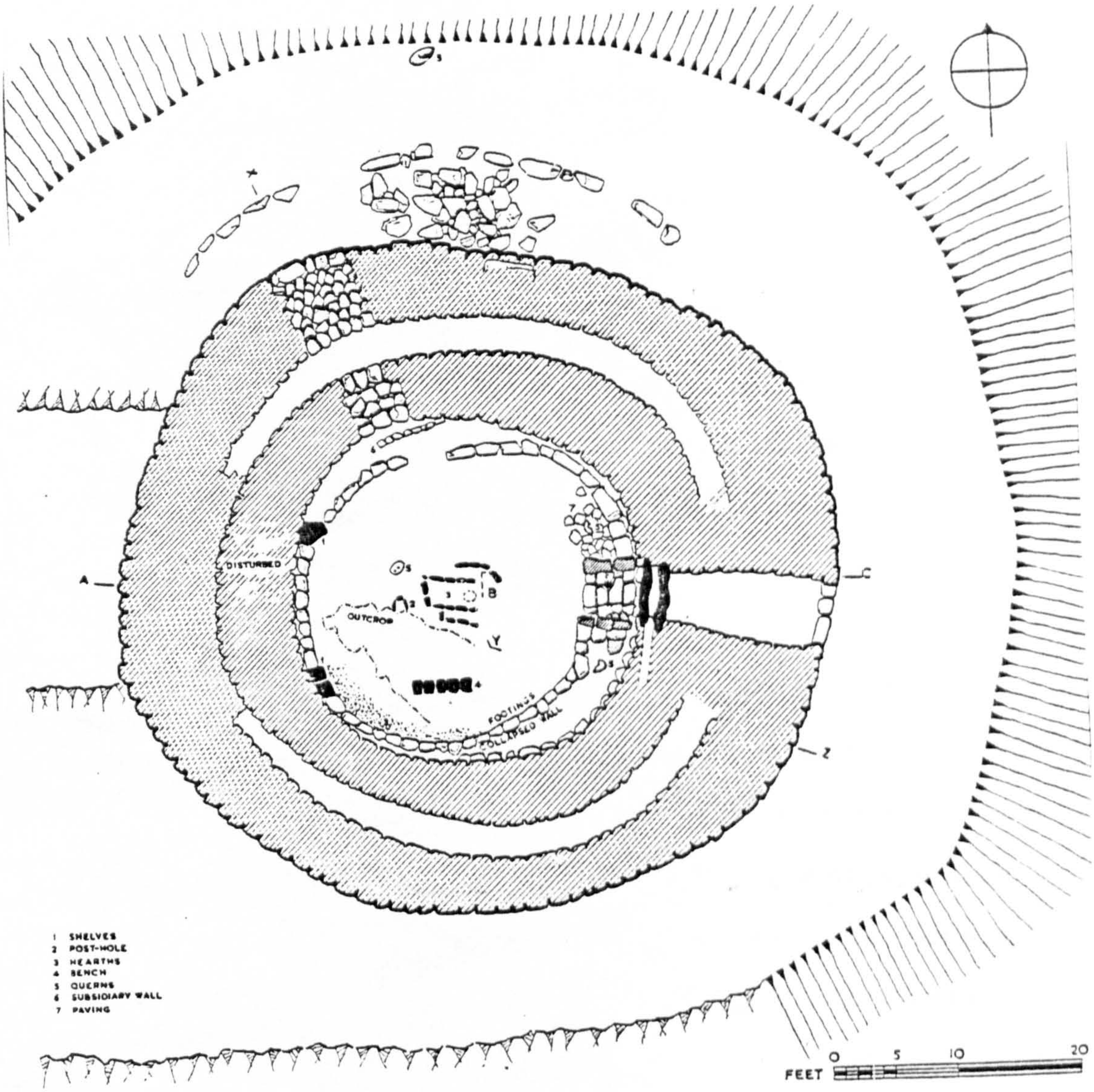


Fig. 105: Dun Cuier site plan (after Young 1956).

width and thirdly an inner wall one stone thick (Fig. 105), which on analogy with Dun Mor Vaul, Tiree, may actually antedate the other two and represent a subsequent phase of later prehistoric occupation. The entrance lay in the eastern sector of the site and measured 4′ in width and also in height with a barhole to secure the door. The entrance passage was paved and partially extended into the fort interior. The interior had a sub circular diameter of 25′ with several hearths, a working bench, a carefully constructed post hole and evidence of the manufacture of both metal and bone objects.

The pottery was thought by the excavator to be of later date than that of Tigh Talamhanta, it bore several of the common Hebridean decorative traits, such as applied wavy cordons, but in addition the bulk of the assemblage was composed of plain storage jars with flaring rims. Several phases were recognized in the constructional and pottery sequences, however, the reliability of the latter are open to question given the gross inconsistencies contained within the published report (Young 1956, 290-327). These relate largely to the contexts within which certain of the sherds were supposed to have been recovered, for example, sherds nos. 1, 4, 5, 9 and 10 (Fig. 106) are described as coming from hearth 1 in the catalogue but hearth 2 in the text for all but no. 9, which is ascribed to hearth 3; similarly nos. 48-49 (Fig. 108) in the text are from the fort entrance, but from hearth 2 in the catalogue! (Ibid., 311 and 313). Where

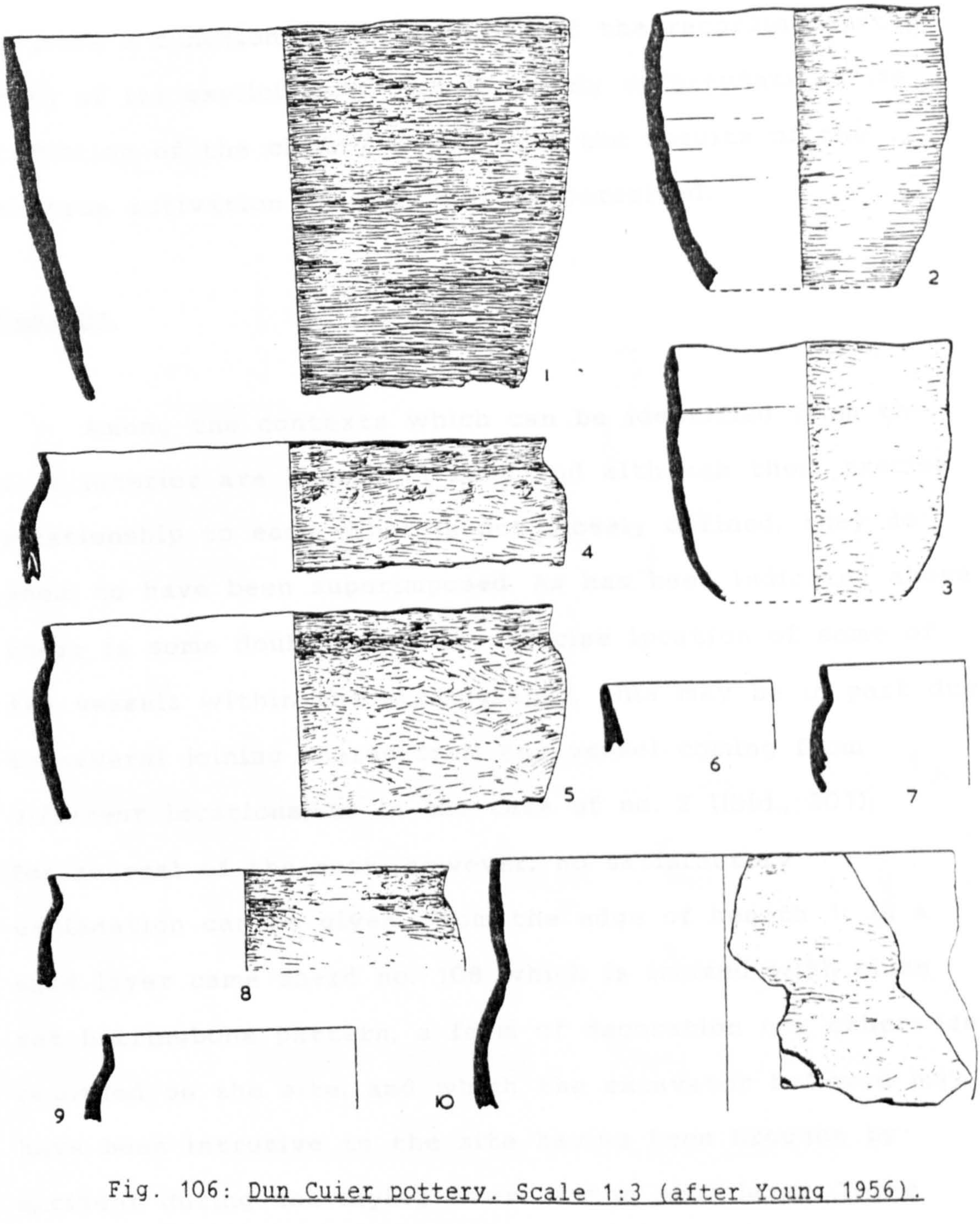


Fig. 106: Dun Cuier pottery. Scale 1:3 (after Young 1956).

such inconsistencies can be demonstrated also throws doubt on those areas where they cannot, because often the latter is more a function of the lackings of the recording system than of its explicitness. This is doubly unfortunate in its reduction of the clarity with which the results of the neutron activation analysis may be perceived.

Hearths.

Among the contexts which can be identified from the fort interior are hearths 1 to 3 and although their precise relationship to each other is not closely defined, they do seem to have been superimposed. As has been indicated above there is some doubt as to the precise location of some of the vessels within the stratigraphy, this may be in part due to several joining sherds from one vessel coming from different locations, as in the case of no. 2 (Ibid., 301); for several of the rest, however, no satisfactory explanation can be given. From the edge of hearth 1, in a sand layer came sherd no. 108 which is incised with close set herringbone pattern, a form of decoration not otherwise recorded on the site, and which the excavator believed may have been intrusive to the site having been brought by accident during the laying down of the sand layer. Three major vessel types were recovered from the hearths, with no well defined distinction being recognizable by phase. From all hearth levels 1 to 3 were excavated coarse 'cooking' pots (nos. 1-10) with plain, or slightly outward flaring

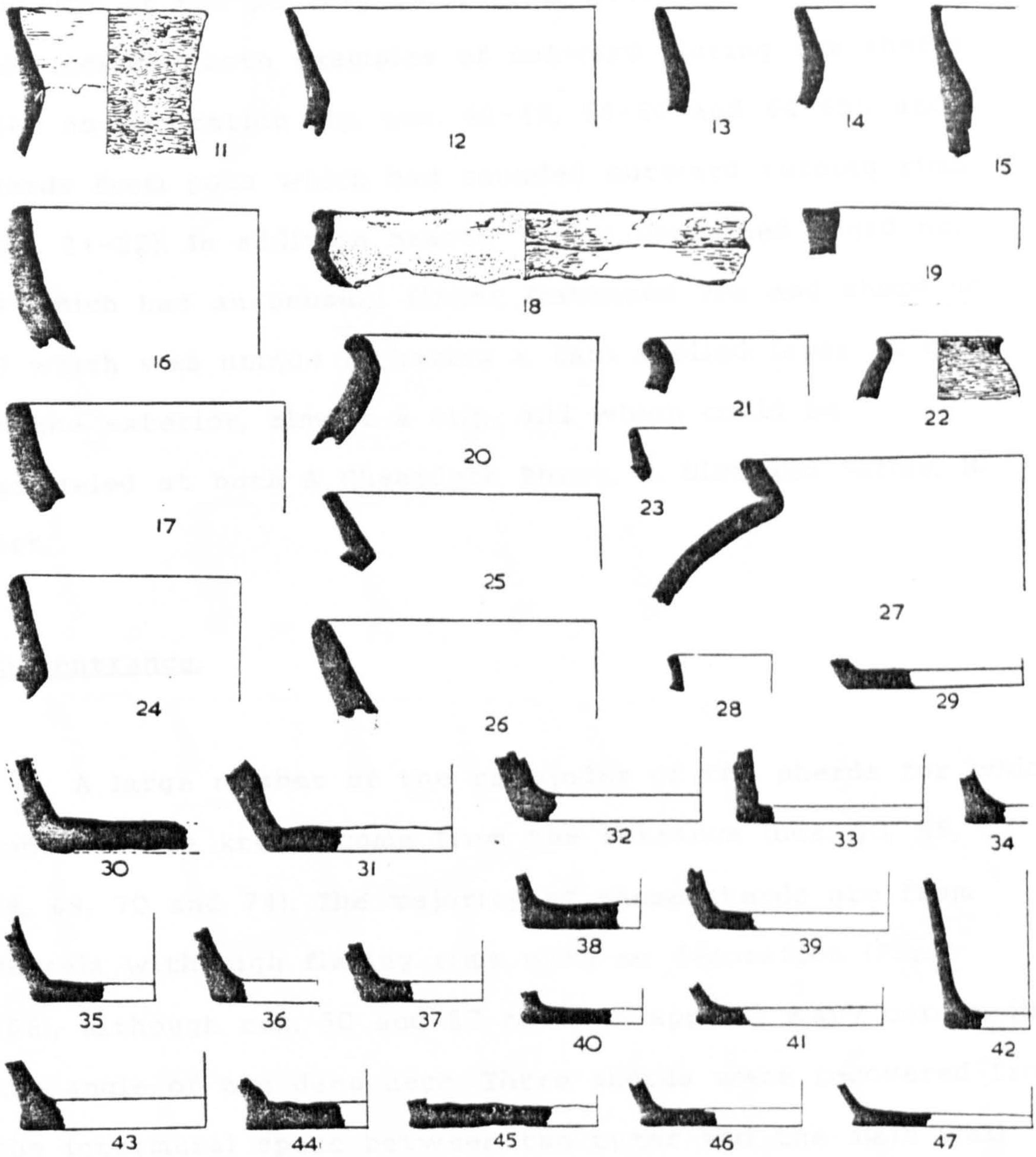


Fig. 107: Dun Cuier pottery. Scale 1:3 (after Young 1956).

rims, in some instances a slight concave neck could be identified with finger tip impressions just beneath (no. 4). The bulk of the pottery came from hearth 2, however, and this included both examples of outward flaring rim sherds with no decoration (eg. nos. 48-49, 59-60 and 64-65), and sherds from pots which had rounded outward turning rims (nos. 21-22). In addition hearth 2 also contained sherd no. 19 which had an unusual finger flattened rim and sherd no. 18 which was unique in having a thin applied layer of clay on the exterior, almost a slip, and which could be paralleled at both A Cheardach Bheag, S. Uist and Sollas, N. Uist.

<u>The entrance.</u>

A large number of the remainder of the sherds for which contexts are known come from the entrance (nos. 50, 55, 57 66, 69, 70 and 74). The majority of these sherds are from vessels with high flaring rims with no decoration (Fig. 108), although nos. 50 and 57 have an applied wavy cordon in the angle of the deep neck. Three sherds were recovered from the intermural space between the outer and the main wall (nos. 27, 95 and 107), the former and latter may not be coeval with the main period of usage of the site. Sherd no. 27 was recovered at a high level in the intermural space, and although the excavator believed that sherds of a similar fabric were recovered from the ash layer above the paving in the eastern side of the fort, its sharply everted rim type

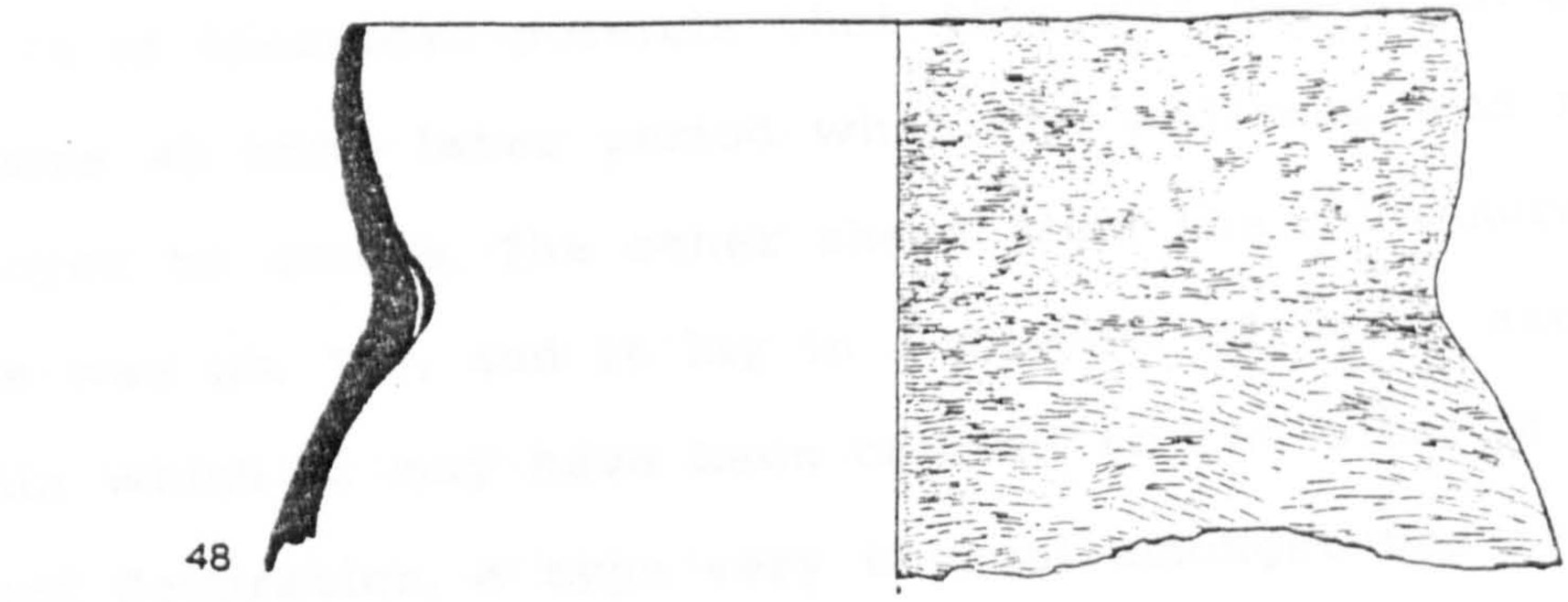


Fig. 108: Dun Cuier pottery. Scale 1:3 (after Young 1956).

is not matched in the remainder of the assemblage from the site. It is therefore possible that this was deposited on the site at some later period when the wallhead was ruined and open to access. The other sherd from the intermural space was no. 107, and it lay in a deposit of beach sand, within which it may have been carried to the site, it bore incised decoration, a type very unusual amongst the rest of the recovered pottery. Sherd no. 95 had an applied moulded finger tip cordon of a type not unusual from this or other Hebridean sites.

The paved area North of the entrance.

The only other named context for pottery, though there must have been many during the excavation, was the paved area to the north of the entrance. Sherds recovered from below, on and above the paving included nos. 68, 90 and 109; the former was of the usual out flaring rim type from the site, and was located under the actual paving stones. Sherd no. 109 was found on the paving and had two whole or parts of ring pin stamp marks, for which a small shouldered pin has been used. In addition there was also part of an incised line running across the stamp which is incomplete. From above the paved area came no. 90, which was from an everted rim vessel which had an applied finger pinched cordon pressed into the neck angle.

One of the salutary lessons which may be drawn from the

site is the occurrence and recognition of sherds nos. 111-116 and 144 as being medieval and associated with 18th century artefacts and walling. Owing to the general similarity in shape and manufacture of medieaval and modern craggans from the Hebrides, there must be several sites from which pottery has been wrongly ascribed to later prehistoric contexts when it derives from much later contexts. This is especially true of sites where the varying phases of occupation are not stratigraphically superimposed, as they are at Dun Cuier. At Tigh Talamhanta, for example, one of the farm buildings thought to be contemporary with the wheelhouse would be more at home in a early modern or modern context, and so may be the pottery that was recovered from it.

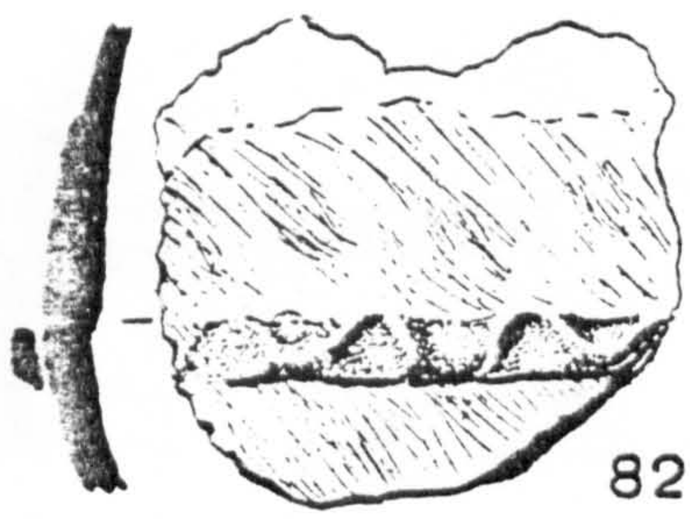
Unknown contexts.

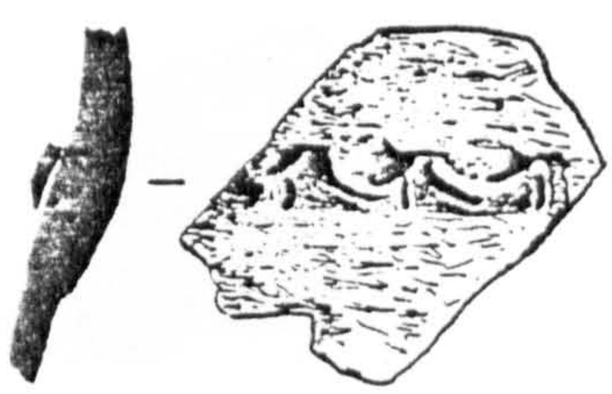
The bulk of the pottery from Dun Cuier can be ascribed to no known context and will be described in outline. Of the rims from the site the majority are from vessels with with outward flaring rims or with inturning lips, mainly illustrated in fig. 108, although a few unusual sherds do occur, such as sherd no. 80 which has a lip which is inward protruding. Only a very few everted or sharply out turned rim sherds were recovered, one of these was from the intermural space (no. 27), others include nos. 25-26, with another being everted but with a rounded almost rolled edge (no. 20). Other rim sherds were from more open bowls with

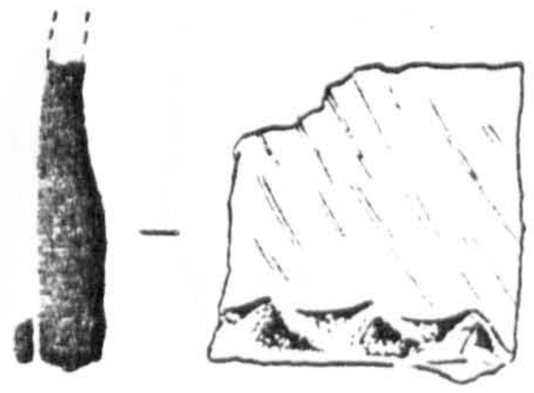
plain rims, for example nos. 16-17. The base sherds, not unexpectedly seem to derive from bowls and from storage vessels of a type suggested by the rims. Decoration consists largely of applied wavy or finger moulded cordons. Of the latter nos. 93-95 are finger pinched, nos. 97-99 seem to have been formed by the application of a straight strip of clay which was subsequently slashed vertically or diagonally with a pointed instrument. No. 92 has two applied wavy cordons, a feature also noted at Dun Carloway, Lewis (Close-Brooks 1977, fig. 6 no. 49), while nos. 91, 103 and 105 (Figs. 109-111) in addition to a finger pressed cordon have part of an applied curving ornament. Only a very few sherds with incised decoration were found, both of these have been described and both were though to be intrusive; no. 107 had limited part of a pattern surviving, no. 108 consisted of close set herringbone decoration.

Chronology.

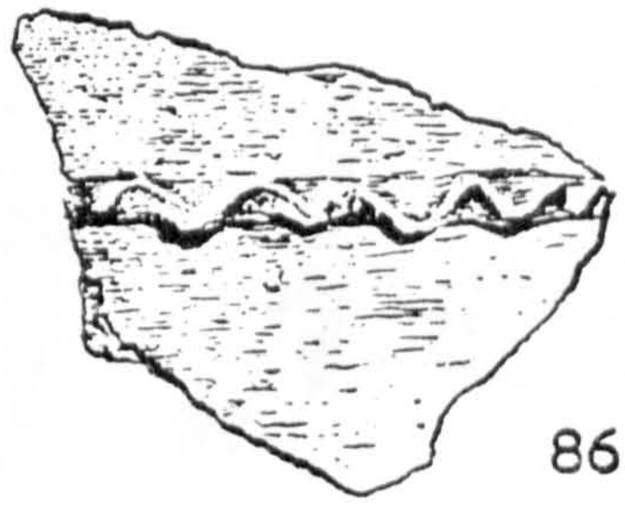
The site was dated by the occurrence of a variety of artefacts which together combine to give the site a cultural 'package' of the early historical period, projected by the excavator to belong to the early 7th century AD. The composite bone combs, pins and pottery are described by one recent study as 'Pictish' (Alcock 1984, 17). The difficulty with this as with many of such similar sites is that, the artefacts which occur lowest in what is already a doubtful stratigraphy, cannot be assumed to belong to the earliest

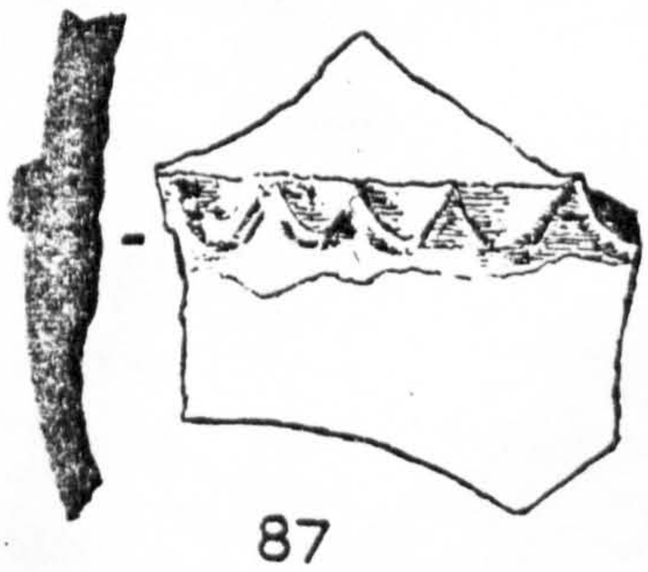

82

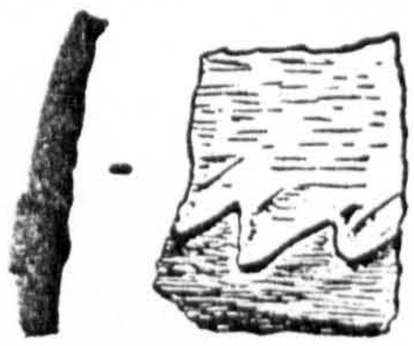

83

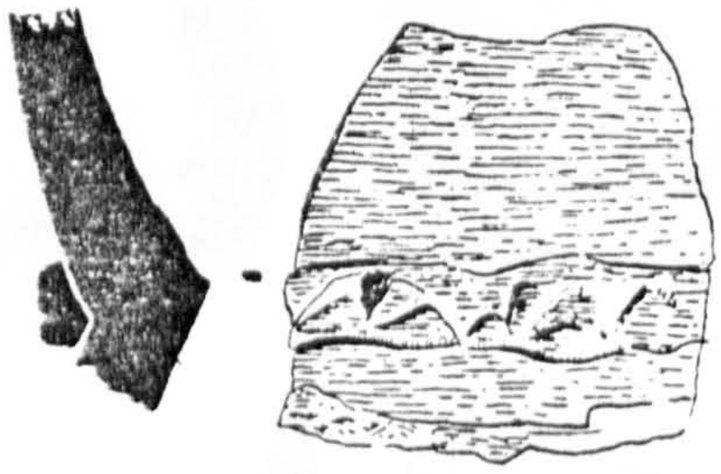

84


85

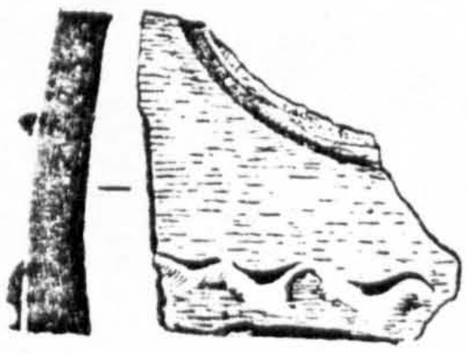

86


87


88


89


90


91

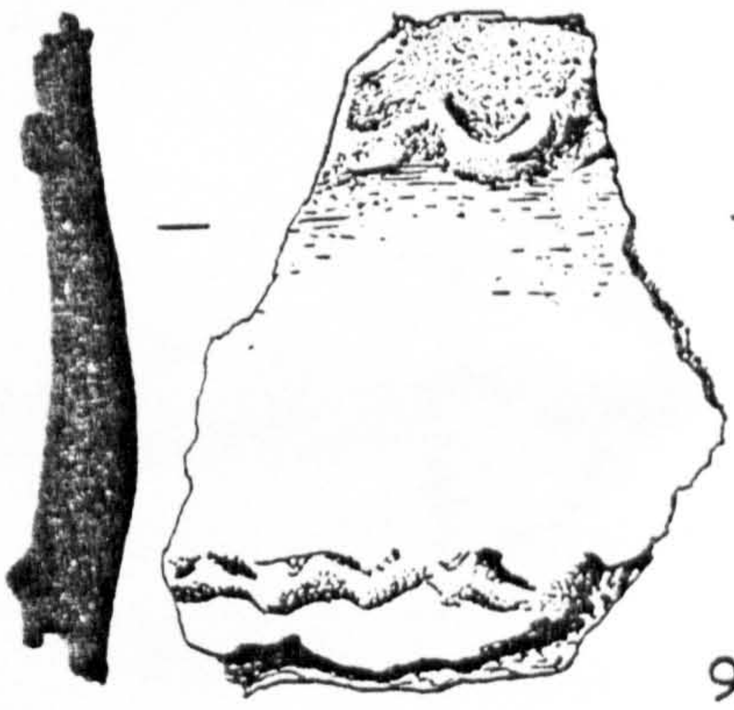
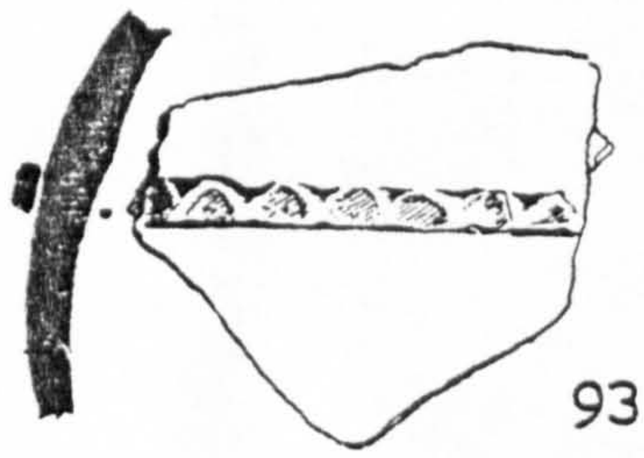
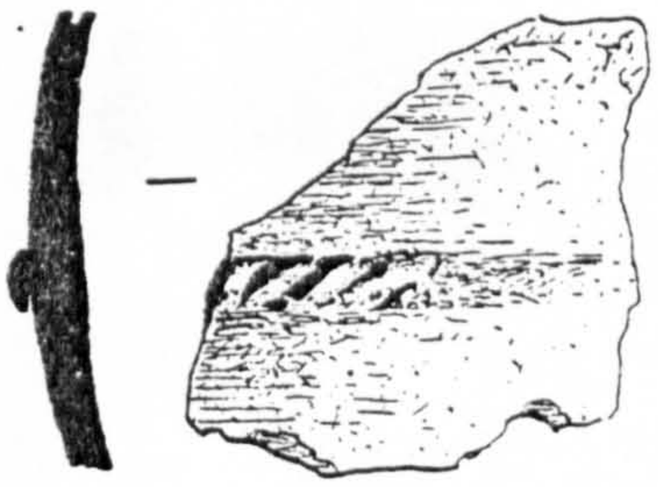

92

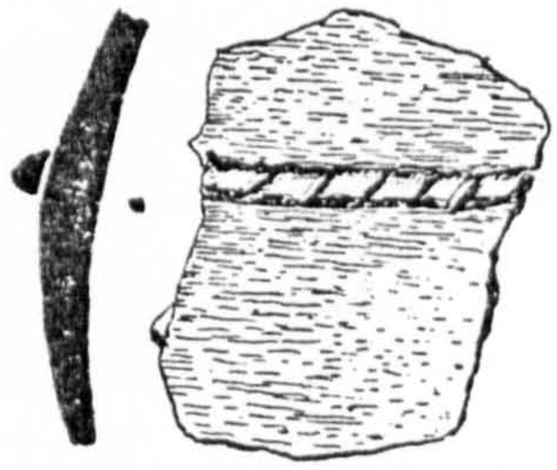
Fig. 109: Dun Cuier pottery. Scale 1:2 (after Young 1956).

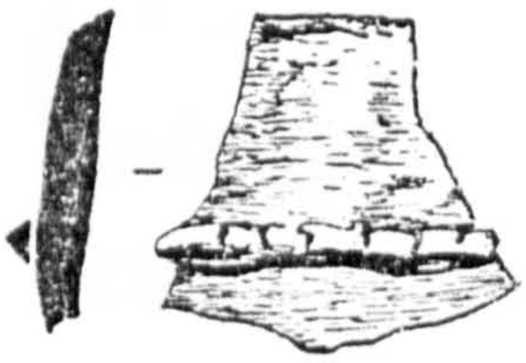

93

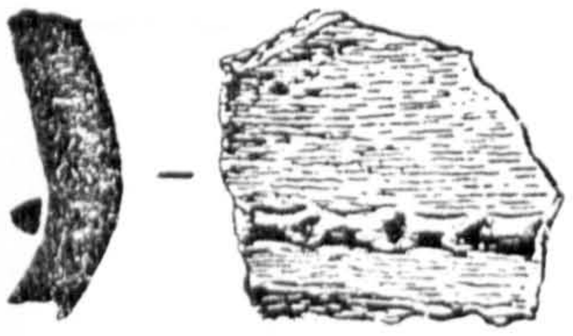

94

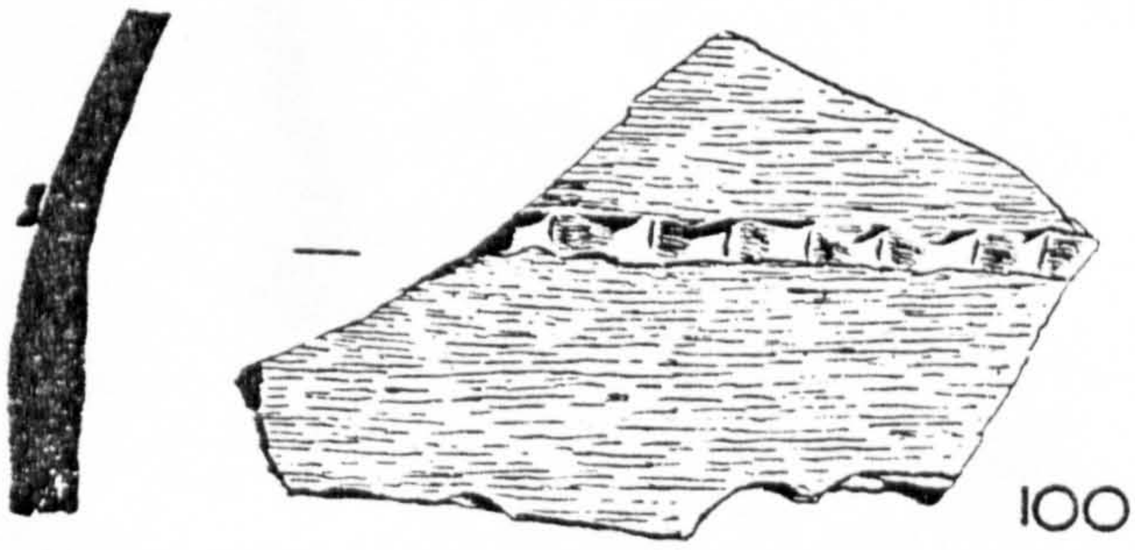

95

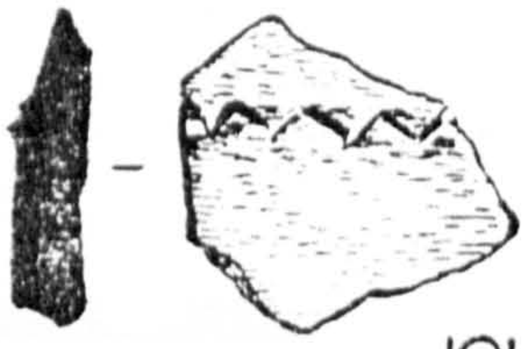

96

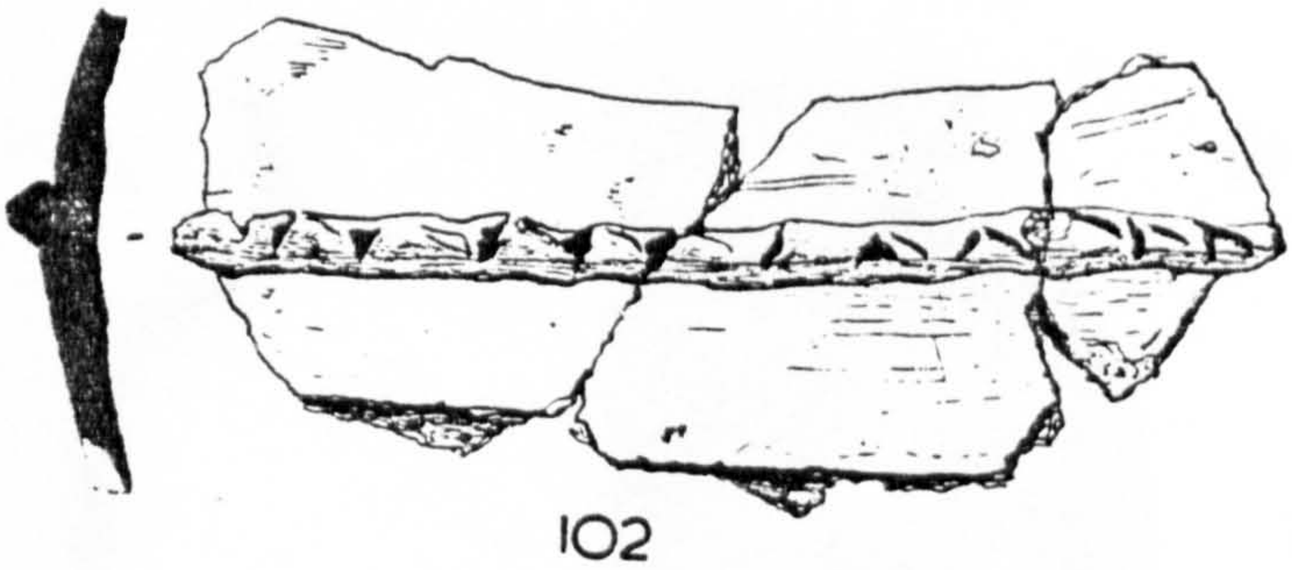

97


98


99

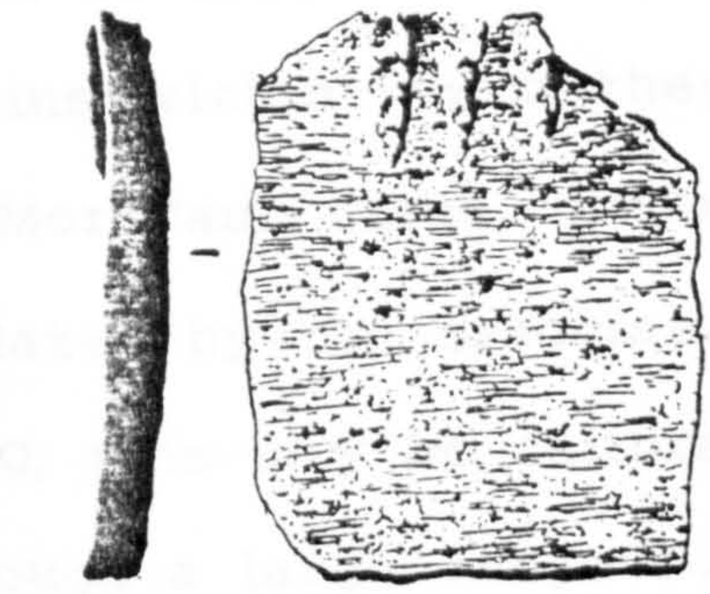

100


101

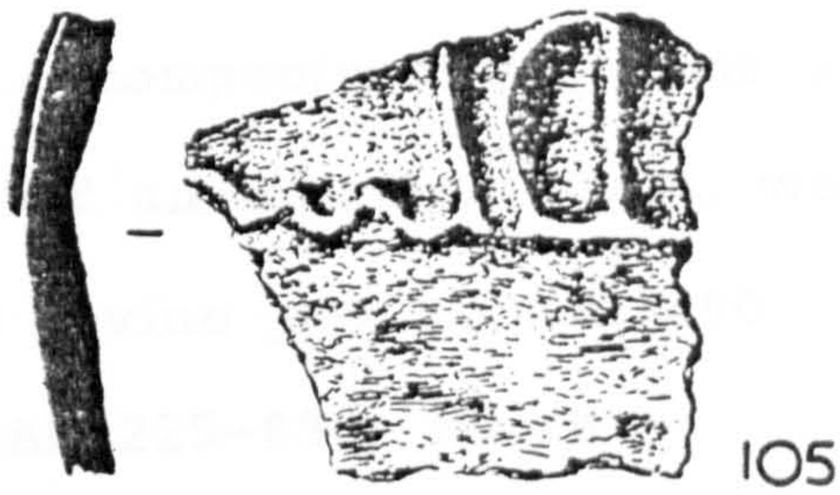

102


103

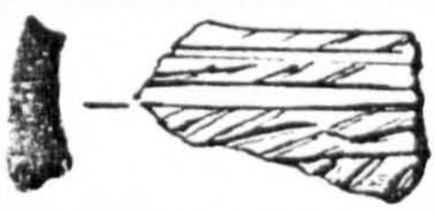
Fig. 110: Dun Cuier pottery. Scale 1:2 (after Young 1956).



104



105

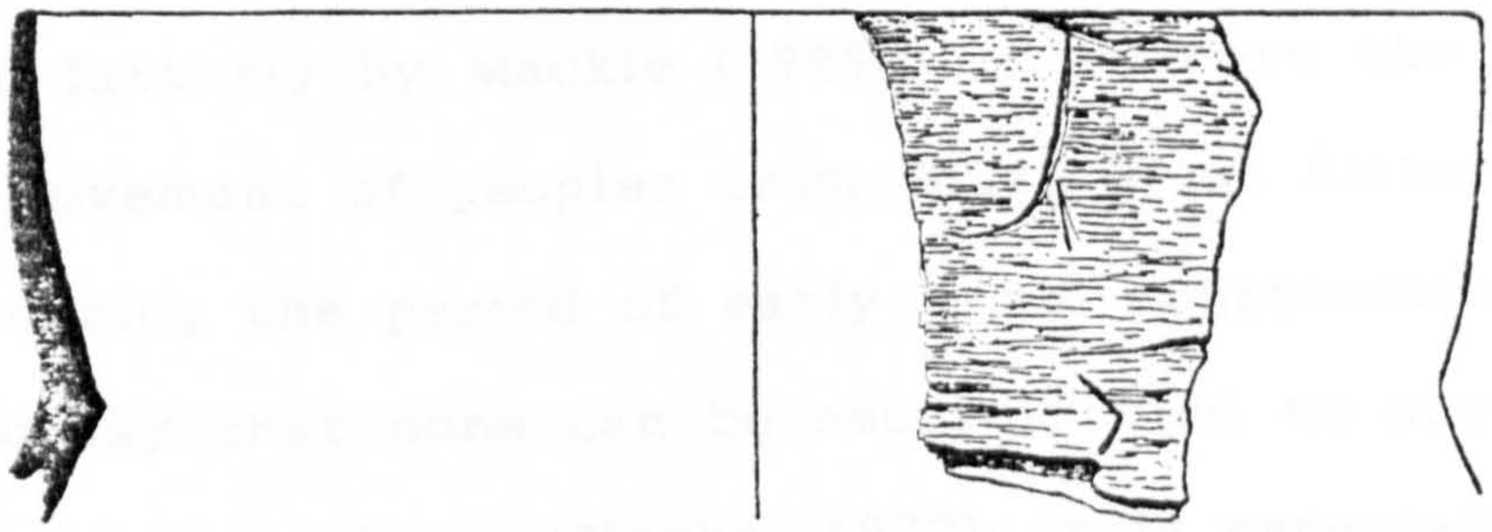


106

107

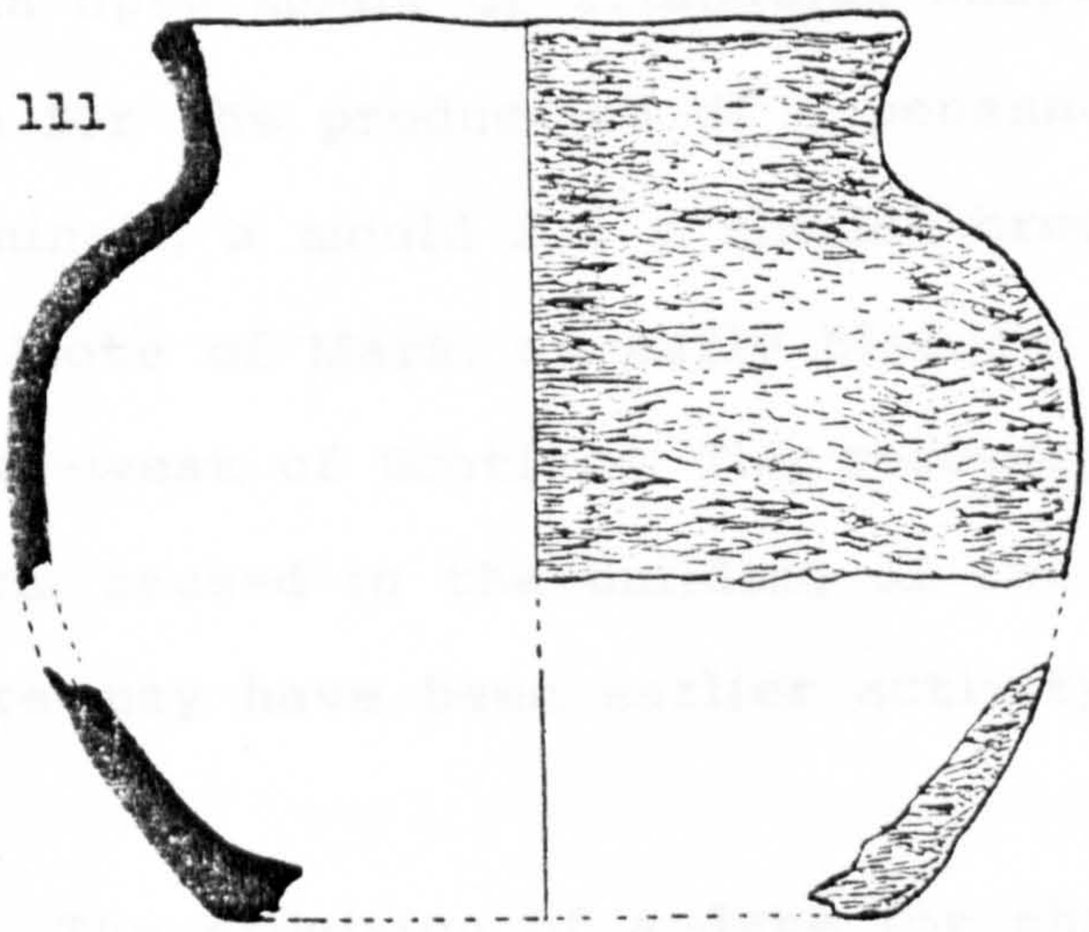
108

109

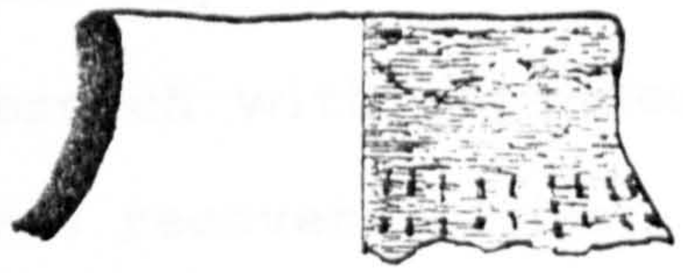


110

Fig. 111: Dun Cuier pottery. Scale 1:2 (after Young 1956).



111

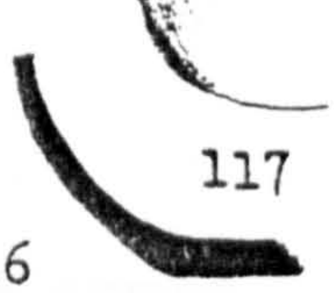


112

113

114

115



116

117

Fig. 112: Dun Cuier pottery from later levels. Scale unknown (after Young 1956).

period of usage of not just the site, but of the structural remains within which they occur. A composite bone comb at Dun Mor Vaul, Tiree, although not of an identical type, was C^{14} dated by the association of a bovine jaw to a.d. 490 ± 200, this may be calibrated to AD 225-890, which although a large range does confirm the late prehistoric to early historic date for at least the later occupation of the site.

Of note from the site were the recovery of several bone gaming pieces, described as dice. These were used by Childe (1935) and latterly by Mackie (1969c) to support the inferred movement of peoples from South West Britain to the Hebrides during the period of early broch construction, suffice to say that none can be securely tied to any primary broch construction level (Clarke, 1970); it is especially a pity that the two examples from Dun Mor Vaul are from an unknown context. Other material from Dun Cuier includes part of an open mould of triangular shape which may have been used for the production of a penannular brooch with expanded terminals, a mould for a similar brooch was recovered from the Mote of Mark, an early historic fortified site in the south-west of Scotland. The recovery of part of a saddle quern, reused in the building of the dun, indicates that there may have been earlier activity on the site.

The provision of a date for the pottery is problematical, it may be contemporary with the bone combs

and dice, but the lack of a stratified sequence of differing types leading to the plain flaring rim jars at the site and the discrepancies in the site report, make any definitive statement unwise. Virtually every modern excavation of a later prehistoric site in the Hebrides has provided evidence of several phases of usage, and unless the excavation and its recording are of the highest standard, doubt must remain as to the validity of the models which may be derived from it. In any case the dangers of deriving a sequence for the whole of the Hebridean chain from the excavation of a single site are obvious; inductive as opposed to deductive logic.

NAA results.

Twenty-five samples were taken from the Dun Cuier pottery assemblage and the results for the post analysis clustering are shown in Fig. 113. Fig. 114 gives the contexts for those sherds for which records of find spots survive, with NAA sample no. 266 being thought by the excavator to be intrusive to the site. Figs. 115-117 demonstrate that 5 distinct clusters and 2 probable outliers were contained within the population of sampled sherds. The interpretation of the clusters is hindered both by the lack of contexts for many of the sherds and by the discrepancies in the excavator's catalogue for those sherds for which records do exist. As with previous sites, the clusters which are based on the NAA results have no apparent correlation with groupings which might be defined archaeologically and

indeed the sherds which the excavator though may have been intrusive are not identifiable as outliers.

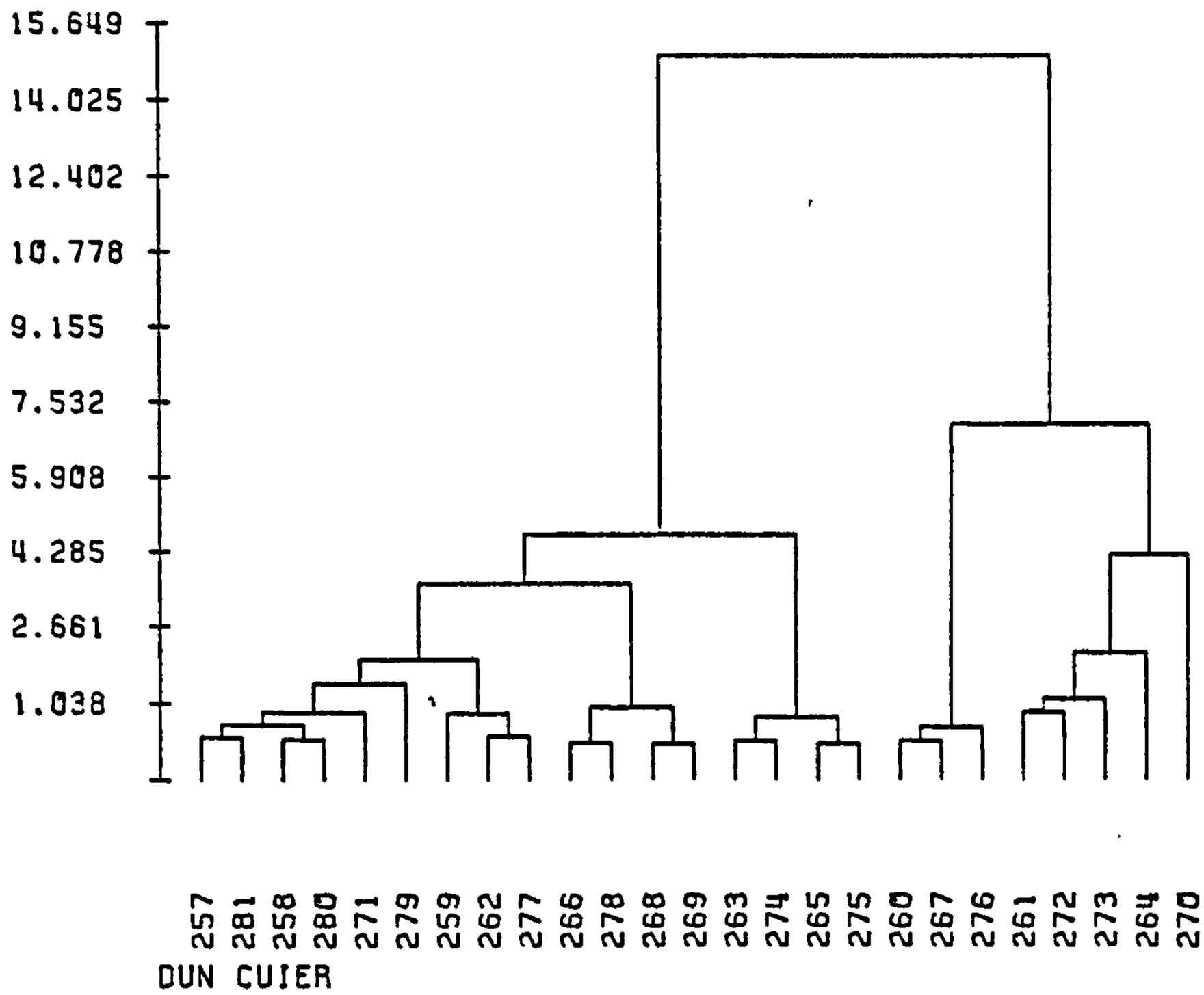


Fig. 113: Dendrogram of sampled sherds.

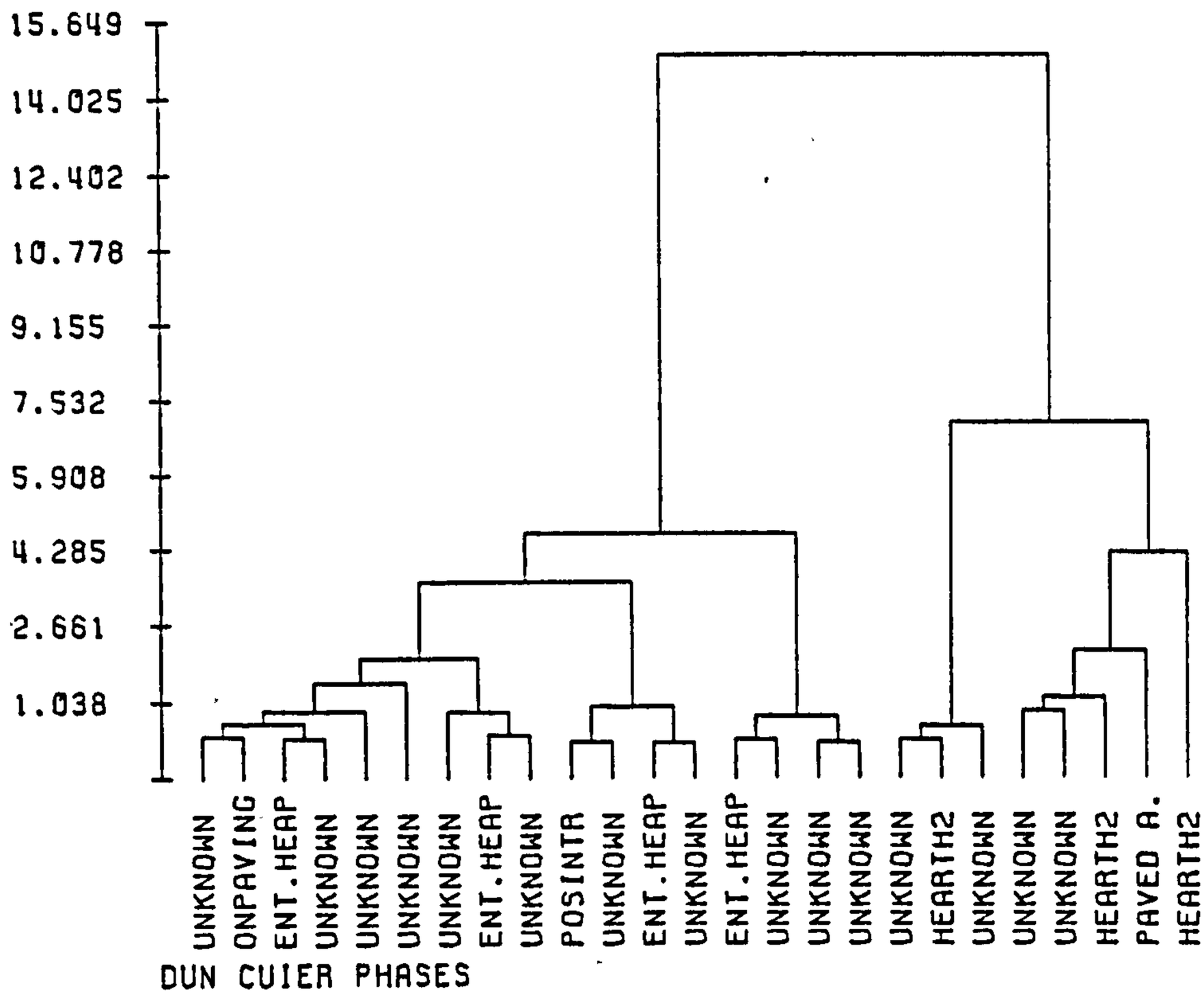


Fig. 114: Dendrogram of sampled sherds, labelled by context.

Dun Cuier

Cluster One: NAA samples 257, 281, 258, 280, 271, 279, 259, 262 and 277. Cluster Two: NAA samples 266, 278, 268 and 269.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	97.8	86.3	99.6	27.8	<0.0	47.7
Accept Null hypo.	Yes	Yes	Yes	Yes	No	Yes

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 115.

Dun Cuier

Cluster One and Cluster Two: NAA samples 257, 281, 258, 280, 271, 279, 259, 262, 277, 266, 278, 268 and 269. Cluster Three: NAA samples 263, 274, 265 and 275.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	64.7	70.0	85.6	<0.0	21.2	<0.0
Accept Null hypo.	Yes	Yes	Yes	No	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population as Cluster Three.

Fig. 116.

Dun Cuier

Cluster Four: NAA samples 260, 267 and 278.
Cluster Five: NAA samples 261, 272, 273, 284 and 270 (264 and 270 probably outliers).

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	55.8	30.3	78.4	2.6	0.2	<0.0
Accept Null hypo.	Yes	Yes	Yes	No	No	No

Null hypothesis: Cluster Four and Cluster Five come from the same population.

Fig. 117.

Dun Cuier: Cluster number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
257	94	Unknown	-------	neatly thumbed up decoration, surface brushed
281	90	from over paving	-------	thick applied cordon, pinched and finger nail nicked
258	66	entrance heap	inturned lip	finger pressed, grass marked
280	58	Unknown	flaring	----------
271	25	Unknown	flaring	----------
279	98	Unknown	-------	slashed cordon
259	16	Unknown	square	----------
262	50	entrance heap	flaring	applied wavy and pinched cordon in the neck, rough surface
277	106	Unknown	-------	remains of slashed decoration, shallow tooling and brushed

Fig. 118.

Dun Cuier: Cluster number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
266	108	edge of hearth 1, intrusive?	-------	fine incised herringbone
278	99	Unknown	-------	finger nail nicked cordon and vertical incision
268	70	entrance heap	projecting	----------
269	81	Unknown	vertical	----------

Fig. 119.

Dun Cuier: Cluster number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
263	69	entrance heap	inturned lip, flat topped	smoothed surface
274	92	Unknown	-------	double row of cordons, inside tool marked
265	87	Unknown	-------	poorly applied wavy cordon, nail marked and brushed surface
275	103	Unknown	-------	applied cordon, incised with chevrons, part of a circular strip

Fig. 120.

Dun Cuier: Cluster number 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
260	72	Unknown	inturned lip, flat	brushed surface
267	21	P? hearth 2	rounded and everted	----------
276	53	Unknown	flaring	brushed surface

Fig. 121.

Dun Cuier: Cluster number 5

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
261	101	Unknown	-------	cordon pushed up and slashed to give a cordon effect
272	93	Unknown	-------	applied cordon in chain effect
273	18	P? hearth 2	square and expanded	covering of thin slip of clay

Fig. 122.

Dun Cuier: Outliers number 264 and 270

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
264	109	paved area	-------	circular impression and part of another made by a ring pin stamp
270	19	P? hearth 2	flattened expanded	----------

Fig. 123.

Chapter Six: South Uist.

'Several Lakes have old Forts built upon the small Islands in the middle of them... There are some Houses under-ground in this Island, and they are in all points like those described in North-Uist'.
(Martin 1716, 84 & 87).

Geological background.

The island of South Uist lies to the north of Barra and like it the underlying geology is dominated by Lewisian gneisses. These contain biotite and horneblende, with occasional occurrence of pegmatite and intrusive ultrabasic peridotites. Along the eastern coast of the island there are occurrences of schist-like mylonite, which were formed by the reactivation of the Outer Isles thrust zone altering the gneisses by metamorphism some 400 million years ago (Smith and Fettes 1979, 80). Of greater significance for the archaeology of the island were the formation of the broad, low machair sands with initiation of the process taking place before 5700 BP (Ritchie 1979, 115).

Location of out cropping clay beds proved difficult, especially on the western side of the island and due not least to the depth of the machair sands. Samples from an insubstantial layer of light brown clay some two cm. thick were, however, recovered from a gravel quarry section at Drimore and subsequently analysed to assess the value of the source as a potting material. The minerals detected by X-ray diffraction included, albite, tremolite, chlorite, quartz,

muscovite and montmorillonite. While the latter of these does occur amongst the clay forming minerals (Deer, Howie and Zussman 1980, 264) and several of the others are amongst the sheet silicates, this could not be regarded as good a source material as those from which other samples were obtained from the Western Isles chain.

History of Archaeological Investigation.

Apart from the existence of fortified stone structures on small artificial or natural islands within the many lochs of the island (eg. Thomas 1890, 403-406), the dominant later prehistoric settlement type has been the wheelhouse. The reason for this bias is twofold; firstly the difficulty with which the former structures were in the past surveyed (RCAHMS 1928, v), even less excavated, and secondly the governmental boost provided to the investigation of the archaeological sites on the machair prior to the construction of the rocket firing ranges in the 1950's. It is unfortunate that of the several, indeed almost numerous, excavations which were undertaken, only two have been satisfactorily published, A Cheardach Mhor (Young and Richardson 1960) and A Cheardach Bheag (Fairhurst 1971), both at Drimore in the north west of the island. An additional, private excavation of a wheelhouse had previously been undertaken by T.C. Lethbridge, at Bruthach a Sithean, Kilpheder but the description and context of the associated artefacts is less than detailed (Lethbridge

1952), and although the sherds from the site were examined, none were selected for NAA.

The site of A Cheardach Mhor.

A Cheardach Mhor (the big smiddy) was a mound some 6' feet high which protruded above the surrounding machair at Drimore, and which upon excavation in 1956, was shown to be the remains of a later prehistoric wheelhouse. At least five phases were detected with sporadic use of the site continuing into the medieval period. The wheelhouse with a forecourt was constructed in phase 1 (Fig. 124), after a period of sand blow was reused in a ruinous condition in phase 1A, was robbed and temporarily occupied in phase 2, and again in phase 3. The stratigraphic relationships are shown in Fig. 125. In phase 4 a hollow was scooped out of the ruins and a hut wall of vertical slabs which had been removed from the earlier wheelhouse was erected (Fig. 126). The final major phase of occupation was much disturbed with few stratified finds, and a general Norse period of occupation and perhaps burial was suggested by the recovery of a human jaw with parts of a composite bone comb.

Phase 1 Pottery.

Pottery was recovered from all phases of occupation, much of it bearing similarities to sites already discussed. Of the assemblage it was fortunate that the bulk of the

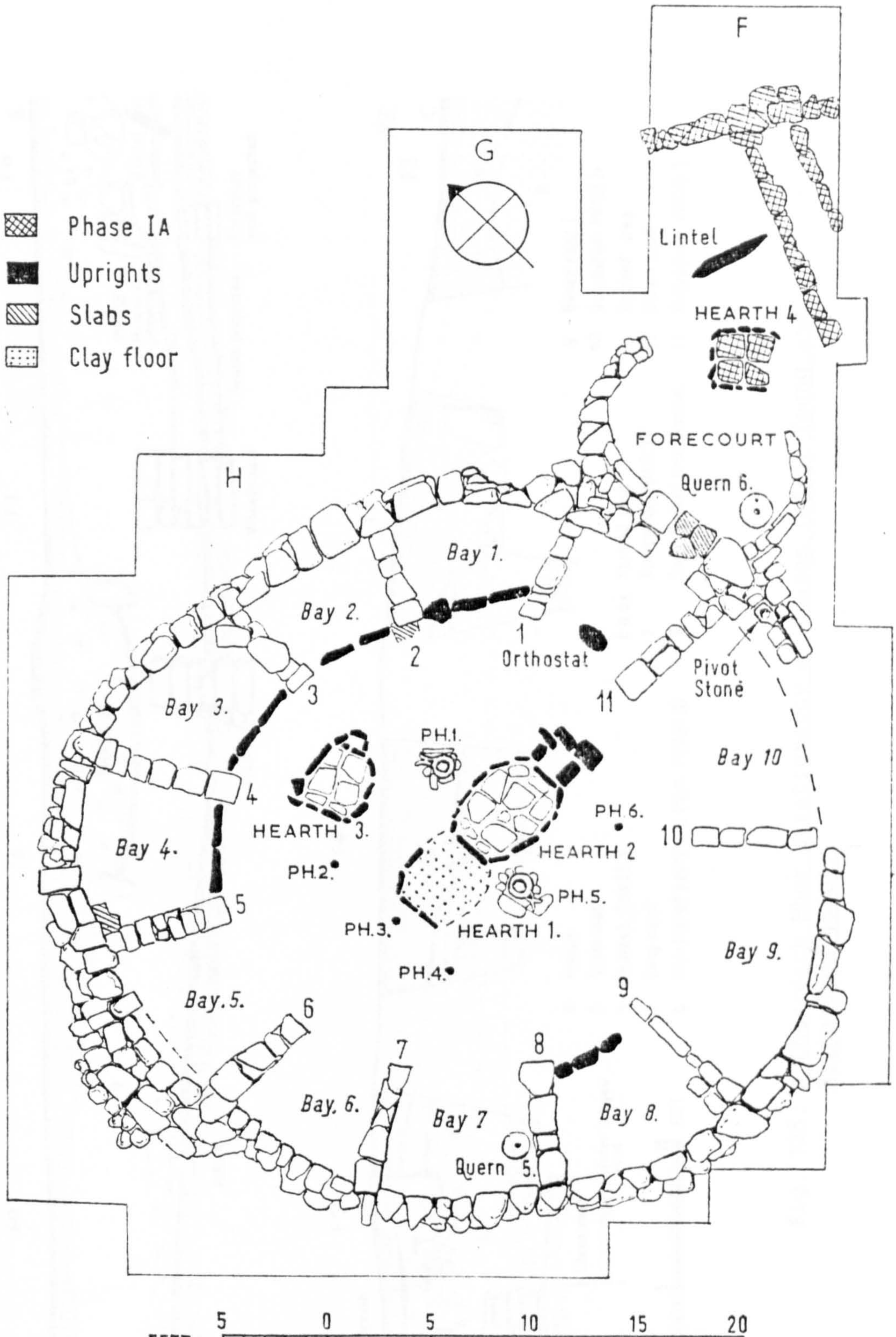


Fig. 124: A Cheardach Mhor phase 1 and 1A site plan (after Young and Richardson 1960).

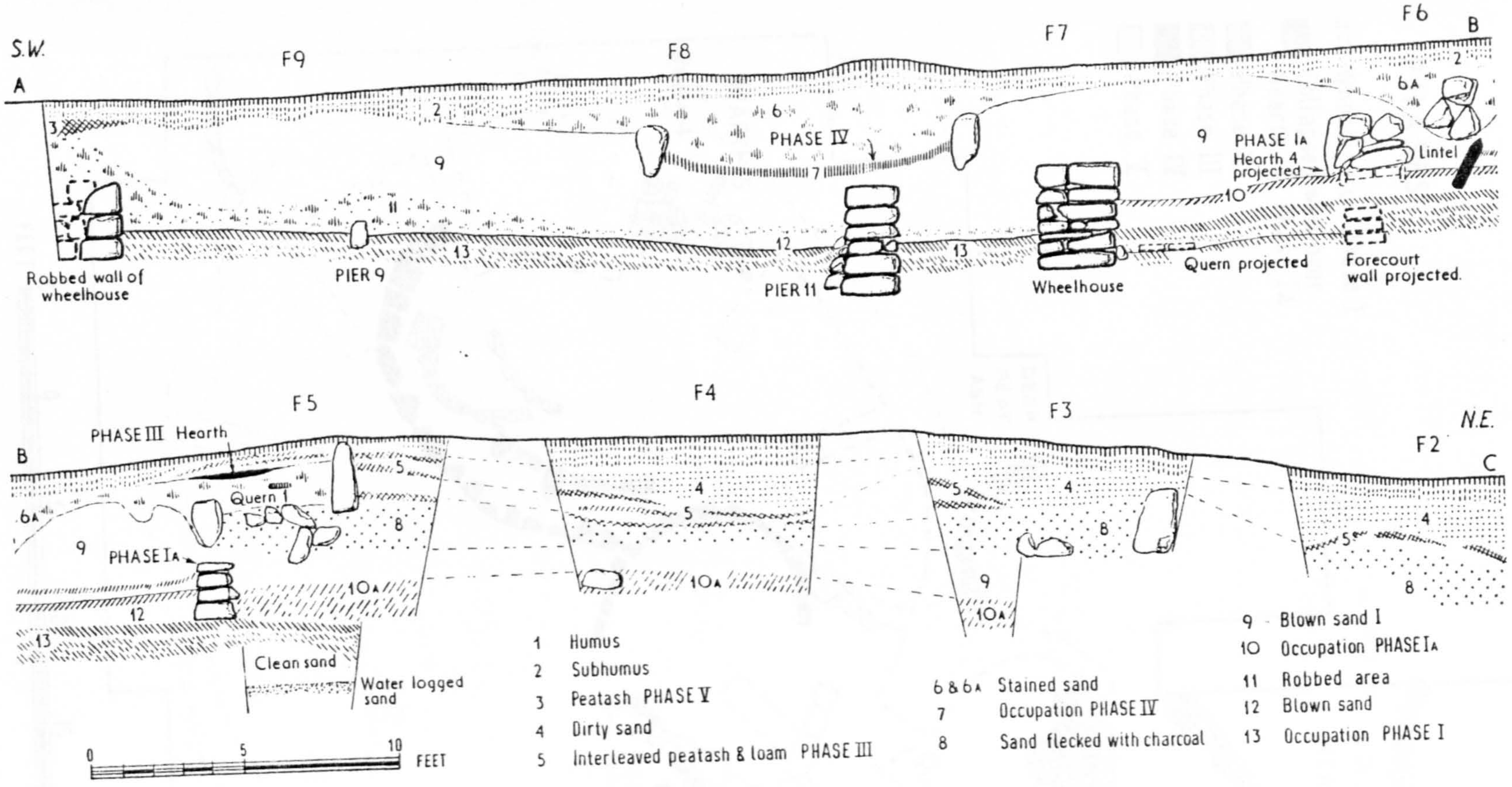


Fig. 125: A Cheardach Mhor stratigraphy of phases (after Young and Richardson 1960).

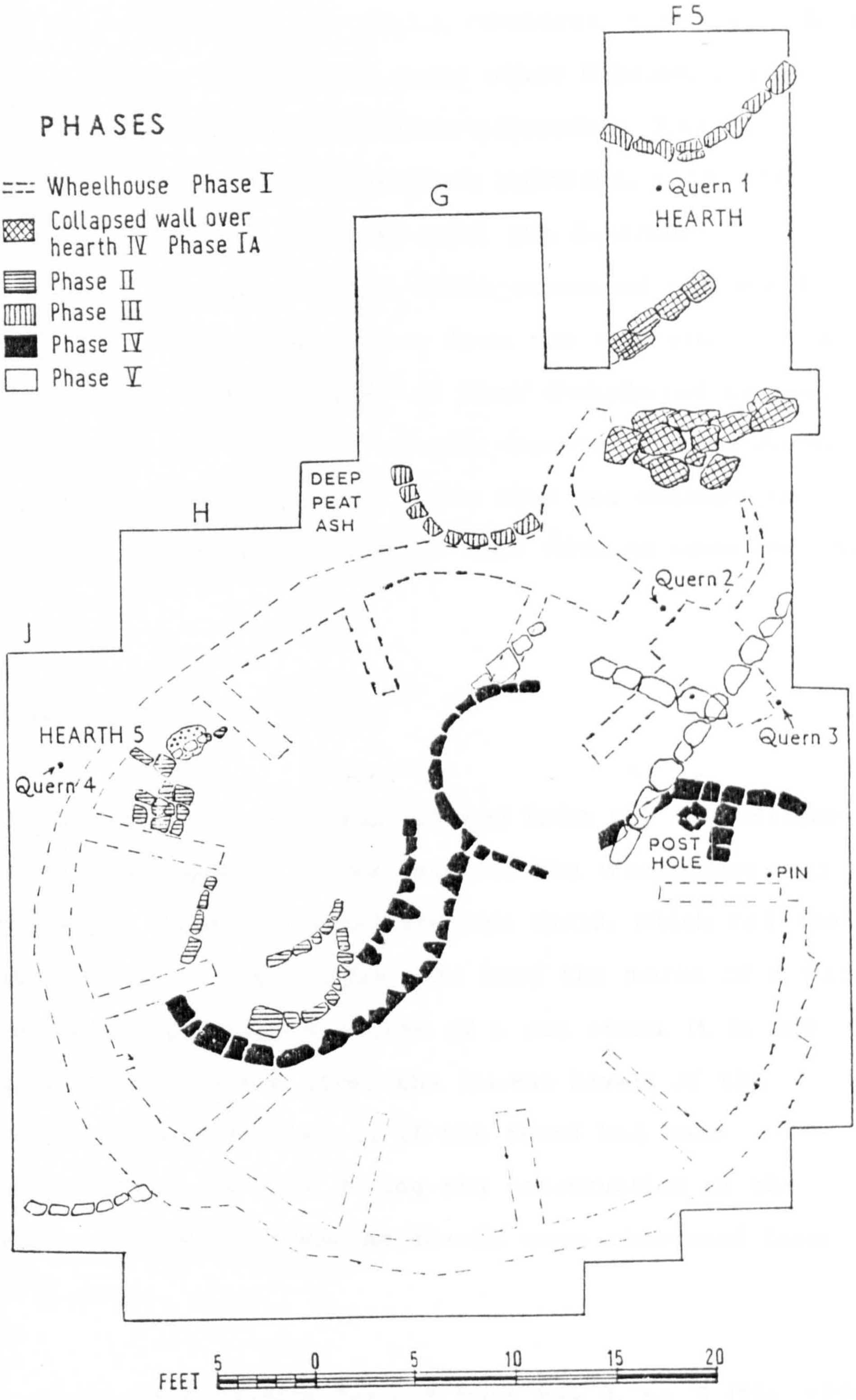


Fig. 126: A Cheardach Mhor phases 1-5 site plan (after Young and and Richardson 1960).

sherds from phase 1 were from largely undisturbed levels and hence could be ascribed to firmer contexts, than those from other phases, or indeed from many other Hebridean sites. Within phase 1 of the wheelhouse occupation, five fairly specific contexts can be identified; individual bays, the central area covered in blown sand, the forecourt, the middens, and the monolith pit which contained one sherd. In common with other wheelhouses from the Western Isles, A Cheardach Mhor had a number of piers distributed radially inwards from the main wall of the structure. These divisions separate the interior of the house into ten conceptually, and perhaps functionally, defined bays with an open central area.

Individual bays.

One sherd (no. 256) was located from the foundations of the main wall in bay 1, this level of the wheelhouse was waterlogged when excavated and the sherd, which had the remains of an applied cordon also bore the marks of a marine encrustation, probably the cast of a sea worm. It is not clear if this occurred after the lowest levels of the wheelhouse were flooded, or if the sherd had been transported to the site during the construction of the primary occupation levels. No sherds were recovered from bays 2 or 3.

Parts of 4 vessels derived from bay 4, no. 5 (Fig. 127)

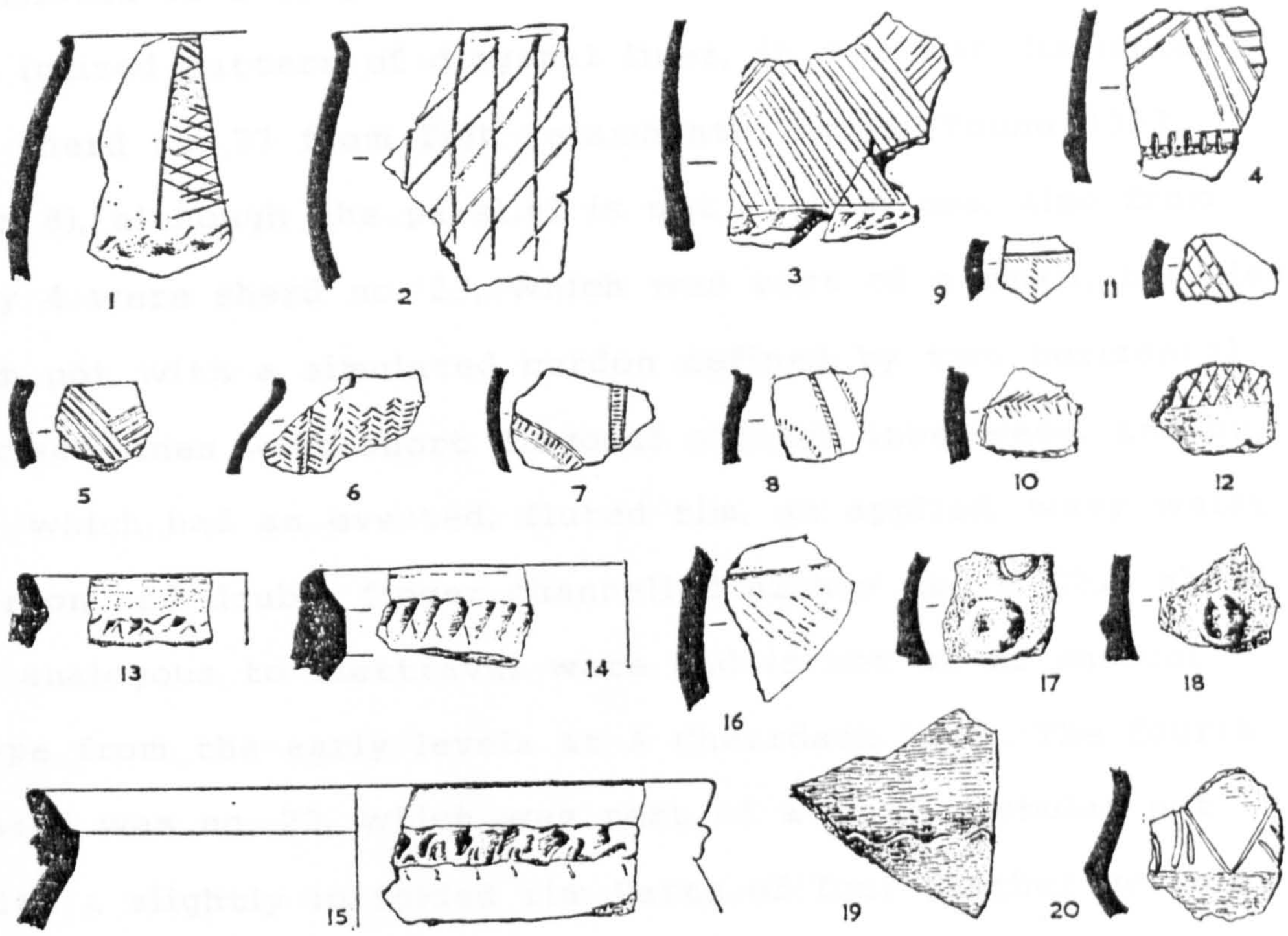


Fig. 127: A Cheardach Mhor pottery. Scale 1:3 (after Young and and Richardson 1960).

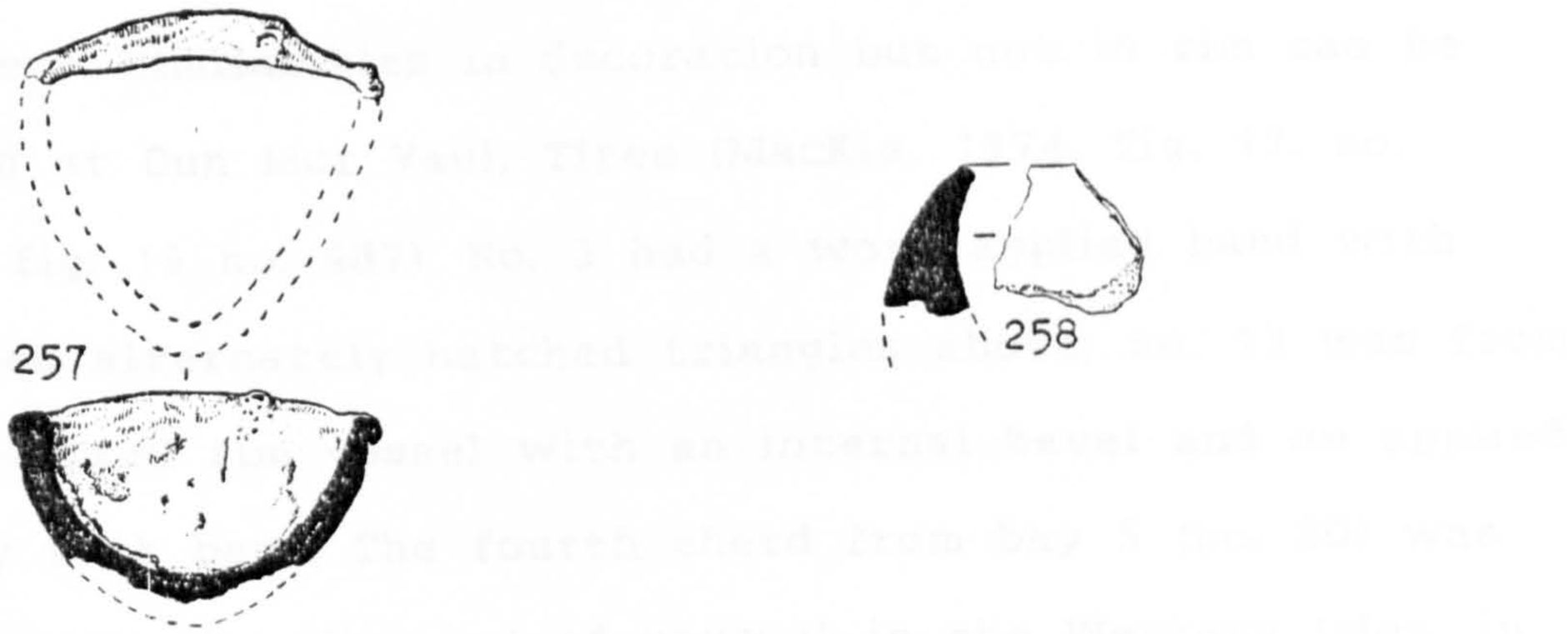


Fig. 128: A Cheardach Mhor crucibles. Scale 1:2 (after Young and and Richardson 1960).

consisted of a couple of fragments of red clay with part of an incised pattern of diagonal lines, it was not dissimilar to sherd no. 77 from Tigh Talamhanta, Barra (Young 1953, fig. 8), although the parallel is not a close one. Also from bay 4 were sherd no. 23, which was part of a small, bevelled rim pot with a simulated cordon defined by two horizontal incised lines with short diagonal strokes inbetween, and no. 31 which had an everted, fluted rim, an applied, wavy waist cordon and double finger channelled arches above. This sherd is analogous to Clettraval ware and is not of an unusual type from the early levels at A Cheardach Mhor. The fourth sherd was no. 22, which was part of a small globular pot with a slightly in folded rim Parts of four further vessels were recovered from the phase 1 context of bay 5, which was the bay at the back of the wheelhouse, opposite the entrance. Sherd no. 2 was from a pot with an abraded out turning lip and was decorated with a coarse, incised lattice pattern. Similarities in decoration but not in rim can be noted at Dun Mor Vaul, Tiree (MacKie, 1974, fig. 17. no. 337, fig. 19 no. 487). No. 3 had a worn applied band with incised alternately hatched triangles above, no. 13 was from an everted rim vessel with an internal bevel and an applied wavy neck band. The fourth sherd from bay 5 (no. 20) was unique to the site, indeed unusual in the Western Isles, in that it displayed a sharp carination at the waist of the vessel. In addition it also had coarsely incised lines above the carination forming an indeterminate pattern; it is perhaps not of later prehistoric date.

Two sherds can be assigned to bay 6, sherd no. 6 is part of a short necked pot with an everted lip and a decoration of a series of columns of incised vertical herringbone. It is in some ways similar to a sherd no. 108 from Dun Cuier, which, however, was thought by the excavator to have been introduced to that site along with sand for flooring layers, so that the analogy unfortunately affords no real extra information on the chronological or cultural context of sherd no. 6. The other sherd from this bay was no. 39 (Fig. 129), part of a base with a burnt inside. The majority of the sherds from phase 1 bay contexts were from bay 7. No. 1 was part of a vessel with an incurving upper body and a slightly out turned lip. The decoration consisted of an applied wavy band with panels of incised lattice pattern above. Another sherd displaying part of an incised lattice from this bay was no. 12. The remainder of the sherds were from everted rim, globular pots and include nos. 25, 27-30 and no. 33 from the base of pier 7 at the junction between bays 6 and 7. Sherd no. 25 was plain, no. 27 bore a flat, smoothed cordon, no. 33 has been reconstructed and has an applied, thumbed cordon. Nos. 28-30 were of Clettraval type decoration with applied wavy cordons and double or triple finger channelled arches above.

Central area.

No sherds are recorded as having come from bays 8-10,

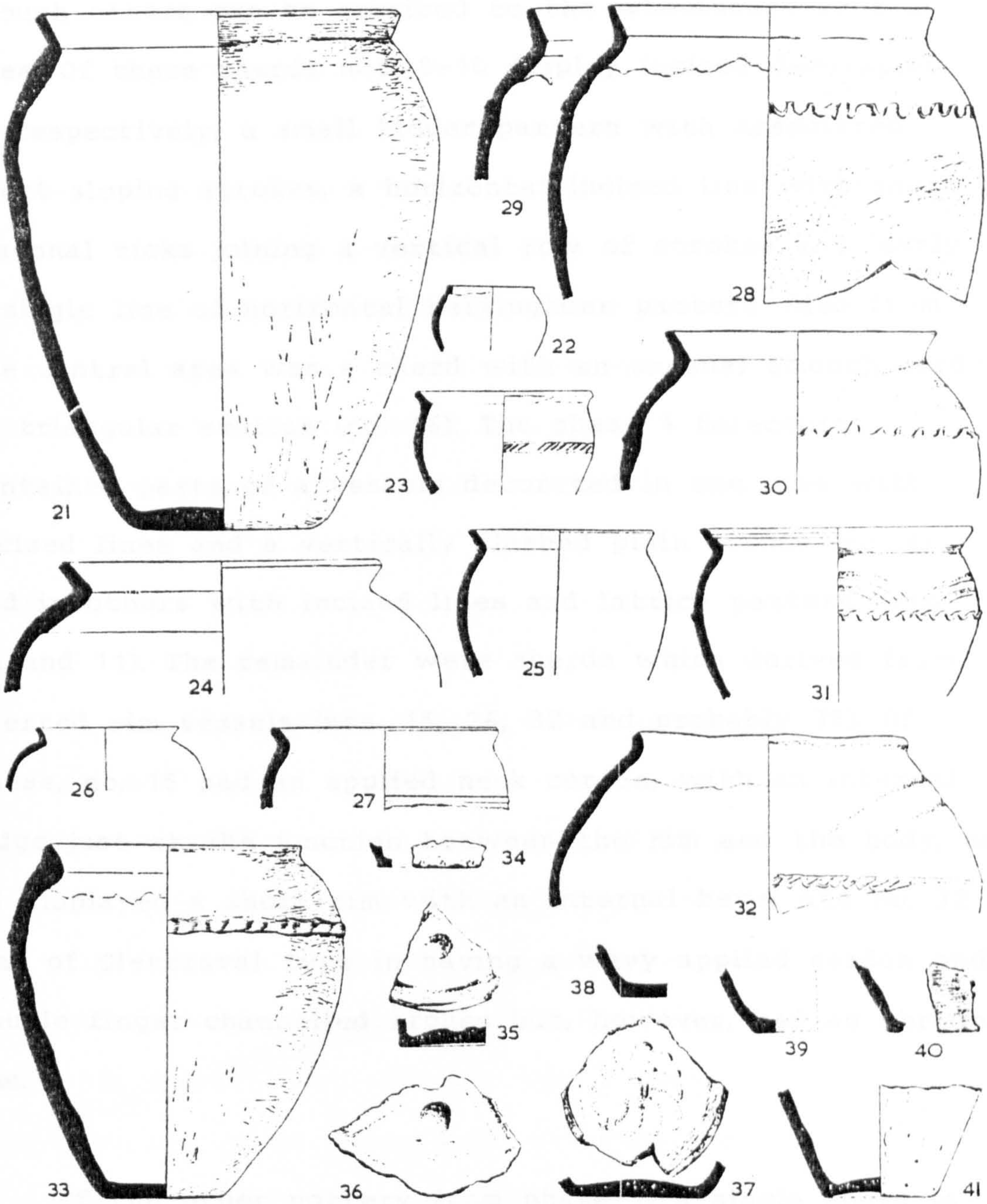


Fig. 129: A Cheardach Mhor pottery. Scale 1:4 (after Young and and Richardson 1960).

though others can be ascribed to the wheelhouse central area. Of these sherds nos. 8-10 display incised decoration of respectively, a small ladder pattern with associated short sloping strokes, a horizontal incised line with short diagonal ticks joining a vertical row of strokes and lastly a single line of horizontal herringbone pattern. Also from the central area was a sherd with an unusual smooth cordon of triangular section (no. 16). The phase 1 forecourt contained parts of a vessels decorated in one case with incised lines and a vertically slashed plain cordon (no. 4) and in others with incised lines and lattice pattern (nos. 4A and 11). The remainder were sherds which derived from everted rim vessels (nos. 15, 26, 32 and probably 38). Of these, no. 15 had an applied neck cordon, with an internal ridge just at the junction between the rim and the body, no 26 displayed a short rim with an internal bevel and no. 32 was of Clettraval type in having a wavy applied cordon and double finger channelled arches but, however, had an abraded rim.

Of the other pottery from phase 1, a single sherd is described as having come from disturbed levels at the back of the wheelhouse wall. It is not clear if this refers to one of the bays, or to the exterior of the wheelhouse itself, which is a pity as the sherd (no. 36) is from a base and displays an internal decoration of broad channelled lines dividing the bottom into quarters with a deep thumb impression in each segment. A very similar sherd came from

the phase 1 middens (no. 35) and others bearing some agreement from the pre broch contexts of Dun Mor Vaul, Tiree (Mackie, 1974, fig. 11 nos. 31-32 and 64). Of the other sherds from the A Cheardach Mhor middens, no. 37 is also a decorated base although in this case of a rosette pattern of overlapping finger prints surrounding a central thumb impression. Other base sherds include nos. 34, 40 and 41, respectively fingernail nicked along the base foot, splayed with finger impressions and dished with a brushed surface.

Midden.

Of the rim sherds or more complete vessels from the middens, nos. 21 and 24 are from pots with everted necks, in addition the rim of no. 24 was bevelled in a similar fashion to those from bays 4 and 7. Sherd no. 14 had a thick everted rim with a double bevel and a deeply thumbed cordon pushed into the neck. Incised pottery, however, was also recovered from this context, for example, nos. 7 and 17. Sherd no. 7 was from a globular vessel and was decorated with two parts of a ladder pattern with parallel incised lines being infilled with short strokes at right angles. No. 17 was notable for having both an applied boss and a part of the impression of the head of a small shouldered bronze pin. While these individual decorative traits are not unusual from the Islands, their conjunction is not recorded from any other site. Sherd no. 18 was also decorated, though with a boss alone, it was recovered from a disturbed phase 5

context and the excavator's grouping of it as being phase 1 is on the similarity with sherd 17 alone; it can not thus be taken to be of a definitive phase 1 context and its association with that material may be misleading.

Monolith pit.

One other phase 1 context was the pit in which a monolith had been erected in the entrance to the wheelhouse. The pit contained sherd no. 19, which had a thin applied wavy line, of a nature not common amongst the other phase 1 contexts. The boulder set into the pit was 2'9" high and had been packed in using clay and stones, some of them broken hammerstones. Its function was not clear, though the pit in addition to sherd 19 also contained a polished gouge like instrument of antler, the excavator suggested a possible structural use, but the occurrence in other wheelhouses of hundreds of pits under the floor at Sollas, N. Uist and the kerb of deer jawbones at the nearby site of A Cheardach Bheag, indicate that some unknown ritual/social purpose is not impossible.

Phase 1A Pottery.

At the end of phase 1 the original wheelhouse was abandoned and infilled by a layer of blown sand. In phase 1A a double wall was built on the eastern side of the site in the area of the wheelhouse forecourt and this was stratigraphically related to hearth 4, a rectangular construction which was stone lined and pebble edged. Only two sherds are recorded in the excavation report as having derived from the 1A levels, there is reason to believe, however, that this does not represent the original total. Both of the ascribed sherds (nos. 42-43) have applied wavy cordons, though in addition no. 42 has double finger channelled parallel arches above (Fig. 130); they are not dissimilar to the pottery from phase 1. The other sherds which also belong to phase 1A are catalogued in the National Museum of Antiquities of Scotland as coming from level 10, a layer which is clearly identified in the section drawings of the site as phase 1A occupation (Young and Richardson 1960, fig. 3). This adds some 53 sherds (nos. 134-162) to the phase 1A total.

Of the rim sherds, the majority are everted (eg. nos. 144-146 and 156-158), while the predominant decoration is the applied wavy cordon (eg. nos. 137-139 and 151-154). On others, however, the decoration is of incised lines (no. 150) and in one example there is cross hatching (no. 140). Thus the phase 1A pottery contains rim types and decorative

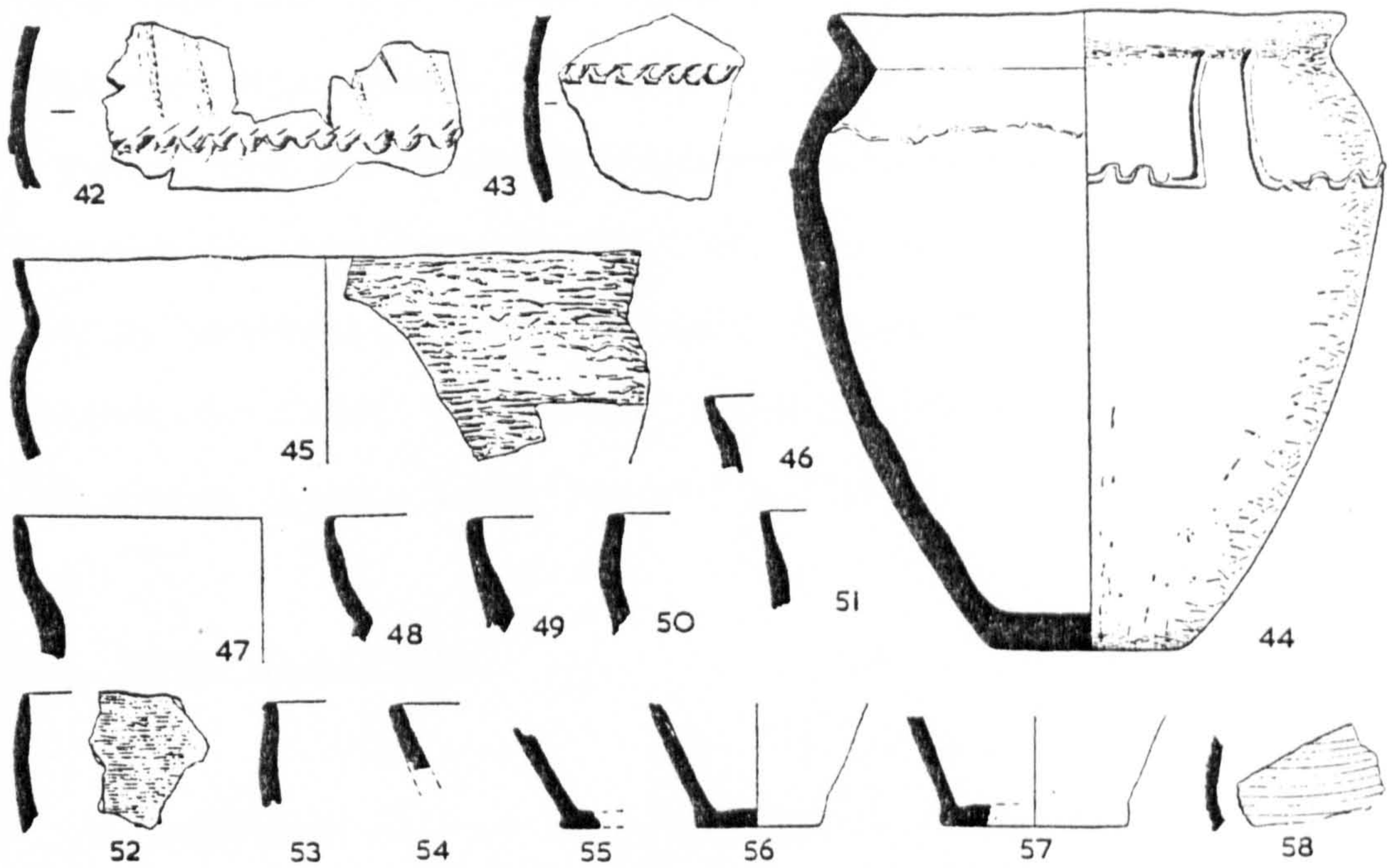


Fig. 130: A Cheardach Mhor pottery. Scale 1:4 (after Young and and Richardson 1960).

styles which occur in phase 1, and not just the everted rim cordoned pottery which is the impression given in the site report.

Phase 2 Pottery.

At the end of phase 1A the site was again covered with blown sand, before being reoccupied on a temporary basis with alteration and partial rebuilding of part of the wheelhouse bays. Sufficient sherds to reconstruct an everted rim vessel (no. 44) were recovered from underneath one of the slabs. It was decorated with an applied wavy cordon which in sections formed an irregular pattern with upward sweeping portions, with some parallels to sherds from Dun Cuier, Barra (Young 1956, fig. 12 no. 105).

Phase 1A or 2 Pottery.

In addition to the pottery described above, a further group (nos. 178-181 and 184-195) derived from an uncertain context at the junction between the two phases; in part these were from hearth 4. In total 9 sherds derived specifically from the hearth, these included several with thick everted rims (nos. 184-185), others with applied wavy cordons (nos. 181 and 187-188) and 2 parts of bases, of which one was almost complete (no. 193). Of a more general phase 1A or 2 context were more sherds with cordons, in one case wavy (no. 189) and in others with oblique or oval impressions (nos. 190-192). Several of the others were unusual, for example, no. 178 had close set oblique lines beneath a broken off rim and no. 194 had its exterior covered by a cream slip. The application of a thin layer of

fine clay is also known from the wheelhouse pottery at A Cheardach Bheag, S. Uist and from Sollas, N. Uist.

Phase 3 Pottery.

There were few traces of substantial structures belonging to this phase, except for short stretches of curved walling lying at a depth of 1' below the modern land surface. Associated with the walling were middens of peat ash with sand levels containing pottery, iron slag, bone and varied shell refuse. The pottery from the middens and from levels disturbed by late robbing of the wheelhouse walls (nos. 45-57) was similar to much of the material from Dun Cuier, Barra with tall upright or slightly flaring rims. Not illustrated in the excavation report were three sherds with incised decoration; no. 196 had a crudely incised ladder pattern, no. 197 had closely spaced oblique lines above a cordon and no. 213 which came from below a stone in the south western corner, had incised panels above a vertically slashed cordon. Parts of two crucibles were recovered, one from a pit (no. 257) was triangular with a greenish deposit on the interior, possibly bronze, the other was from a blown sand level above the wall which was robbed in phase 3 (no. 258). It was of a very soft fabric so either it was never fired or has been mislabelled as a crucible. The attribution of many of the sherds to phase 3 is open to some question as the stratigraphic section (Fig. 125) is not continuous and where breaks occur, doubt must also exist.

Phase 4 Pottery.

In this phase the evidence of habitation was a semicircular wall of robbed wheelhouse slabs set vertically into the sand (Fig. 126). There was further disturbance and rebuilding to the east of the wheelhouse, with a 'T' shaped wall also being built of slabs and also the construction of a stone lined post hole. Only one sherd was described as being located from this context by the excavator (no. 58) and even that was not strictly stratified, coming from a disturbed level near to entrance passage of the phase 4 hut (Fig. 130). It had a regularly rilled outer surface and was identified by C.A.R. Radford as being of 7th/8th century date and as being an example of an imported ware more common on Irish sites (Young 1958, 94). The sherd, however, is not wheelmade, as reported, has similarities with several sherds from the late broch/post broch levels of Dun Mor Vaul, Tiree (MacKie, 1974, fig. 18 nos. 372-374) and is almost certainly not a Mediterranean import (Alcock, 1984, 17). Sherd no. 217 had an applied wavy cordon.

Phase 5 Pottery.

Above the phase 4 occupation there was much disturbance, with remnants of insubstantial walling and evidence of a burial, consisting of human bone and possibly associated composite comb with some sherds of pottery (nos.

218-219). Of the 3 sherds of no. 219, 1 had a narrow cordon impressed with vertical nicks. Other sherds which were recovered from this level were thought by the excavators to have derived from earlier phases and were accordingly described as such. These include no. 18 (Fig. 127), which had the applied boss similar in some ways to no. 17 from phase 1 and no. 49 which had an outward flaring rim comparable to sherds from phase 3. While these attributions to other contexts may be correct, they do seem to be based on preconceived notions of pottery sequences which may or may not be valid, hence no weight can really be placed on these sherds for interpretive purposes.

<u>Pottery assignable to Contexts but not to Phases.</u>

In addition to the pottery described above, other sherds from the site are assigned to contexts, but not to phases and are contained in the catalogue of the National Museum of Antiquities of Scotland. Broadly these contexts are individual bays, the wheelhouse middens, the central area and a context simply labelled 'later levels'. Of these the pottery which came from the wheelhouse bays and the central area is possibly of fairly early date in the period of the site's usage, as in later phases the bays were infilled with sand and debris, with some of the later occupation occurring outside the walls of the original structure.

Two sherds of unknown phase came from bay 2, one had an applied wavy cordon (no. 76), the other had a neck cordon and an everted rim (no. 77). Also decorated with applied wavy cordons were the few sherds from bay 4 (nos. 79-80) and several of those from bay 5 (nos. 81-82). Sherd no. 83 also from bay 5 had an everted rim. Bay 6 contained pottery in much greater quantity (nos. 84-98), most were from everted rim vessels with applied wavy cordons, although 1 sherd had a single incised line (no. 90) and in 1 case the cordon was in the neck of the pot (no. 84). The assemblages from bay 7 (nos. 99-104), bay 8 (nos. 105-125) and bay 9 (nos. 126-133) were also dominated by cordoned everted rim vessels, with one example of the Clettraval type in bay 7 (no. 101) and others in bay 8 with grooves and arching impressions.

The central area pottery of no known phase (nos. 59-75) included sherds of everted rim, cordoned vessels, vessels with arching impressions on the shoulder, and in addition, unlike the bays, also sherds with patterns of incised decoration. The decoration on sherd no. 59 consisted of a part of a panel of incised lines lying obliquely to one straight line, the exterior of no. 60 was covered with closely spaced incised herringbone pattern. A salutary lesson is provide by sherd no. 61, which has a straight cordon which starts to go wavy at one end; there must be many sherds from the Western Isles which are incorrectly thought to come from different vessels on cordon shape and pattern alone.

The bulk of the sherds from the unknown phase middens (nos. 163-177, 180, 185 and 193) were also of the everted rim cordoned type, with some of the cordons having slanting nicks as opposed to being wavy. Sherds 169-170 both had incised decoration, with the former having triangles filled with incised lines above a worn cordon. The last major context from which pottery was derived, was simply labelled as 'later' in the National Museum of Antiquities' catalogue. In this category were sherds nos. 220-255 and although the majority of the rims were everted, plain rounded rims and taller, slightly flaring rims were also represented. The predominant decoration type was again the cordon, some wavy others with slanting impressions. Sherd no. 241 had 3 grooved arches, nos. 224 and 254 had externally striated surfaces.

Chronology.

Two yellow vitreous paste beads were recovered, one unstratified the other from the wheelhouse floor in phase 1. These have been discussed with regard to other sites, generally a date in the late centuries BC first century AD seems accepted (Guido, 1978, 76). Phase 1 contained traces of iron metal working in the form of slag and part of a bronze ring though the chronological ranges for such objects are wider than the band provided for the beads and do little to refine the period of the phase 1 usage. Further evidence

of metalworking was also recovered in the form of slag and crucibles in phase 3. Six whole or parts of rotary querns from phases 1-3 came from bays or other working contexts, in contrast to the single broken saddle quern which was recovered from the phase 1 walling of pier 11.

In phase 4 a cast bronze pin was excavated from near the wall of the hut. It had a perforated head and a plain bronze ring with the unperforated sides of the head having been shaped and grooved. The pin was believed to have close parallels with others from Irish sites, such as Lagore crannog, and was dated to the 7th/8th centuries AD (Young 1958, 93-94). The ring seems to belong to the spiral ring class, with only one other example known in Scotland, that in the collections at Inverary Castle. The dating for such pins has been revised in Ireland with the rejection of the historical assumptions upon which the dating of Lagore was based, and by the recovery of more pins from Irish sites which have contexts of the 5th/6th centuries (Fanning 1983, 325).

The sherd which was allegedly a Mediterranean import is now known not to be (Alcock 1984, 17) so the 7th/8th century date provided for it on the basis of Irish imports can also be rejected. Sherds with similar rilling were recovered from the late broch/early post broch context at Dun Mor Vaul, Tiree and from the dun phase 2 packing and 3 rubble contexts at Dun Ardtreck, Skye. At Dun Mor Vaul sherds of Roman

samian ware and a part of a Dragendorf cup dated to AD 140-180 were recovered from other of the sigma post broch deposits, while the rubble foundations of Dun Ardtreck have a C^{14} date (MacKie 1969, 17) which when calibrated on the Klein curve (Klein et al., 1982) gives a range from the mid 4th century BC to the mid 3rd century AD. Clearly if the analogies are good ones, the rilled sherd from A Cheardach Mhor cannot be taken to indicate the date that was ascribed to it, especially given the doubts as to its exact stratification within phase 4 (Young and Richardson 1960, 167).

The bone artefacts from A Cheardach Mhor include pins and combs. Pins were recovered from Phases 1 and 3, with the phase 3 pins having parallels from other sites in the Atlantic province. A similar but also a wider range was recovered from the broch of Burrain, Orkney and these and others were thought to be of pre Viking Dark Age date (Stevenson 1955, 293). A starting date for the sequence was given as the 5th century and a similar period for the Burrain broch composite combs (MacGregor 1976, 102), which also bore similarities to the phase 5 double sided comb from A Cheardach Mhor.

NAA results.

Fifty-one NAA samples were taken from the A Cheardach Mhor pottery, with 2 of those being duplicate samples from

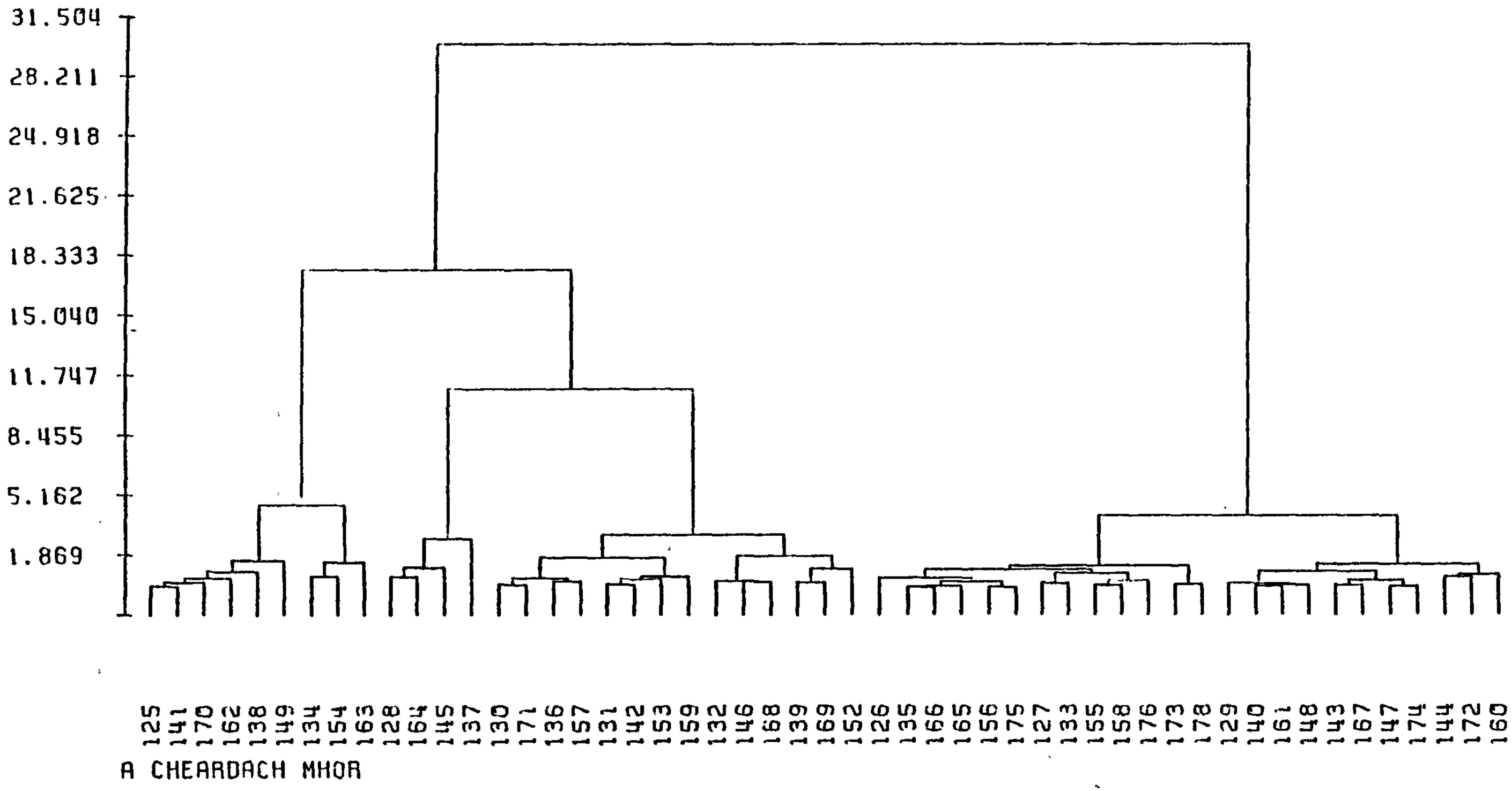


Fig. 131: Dendrogram of sampled sherds.

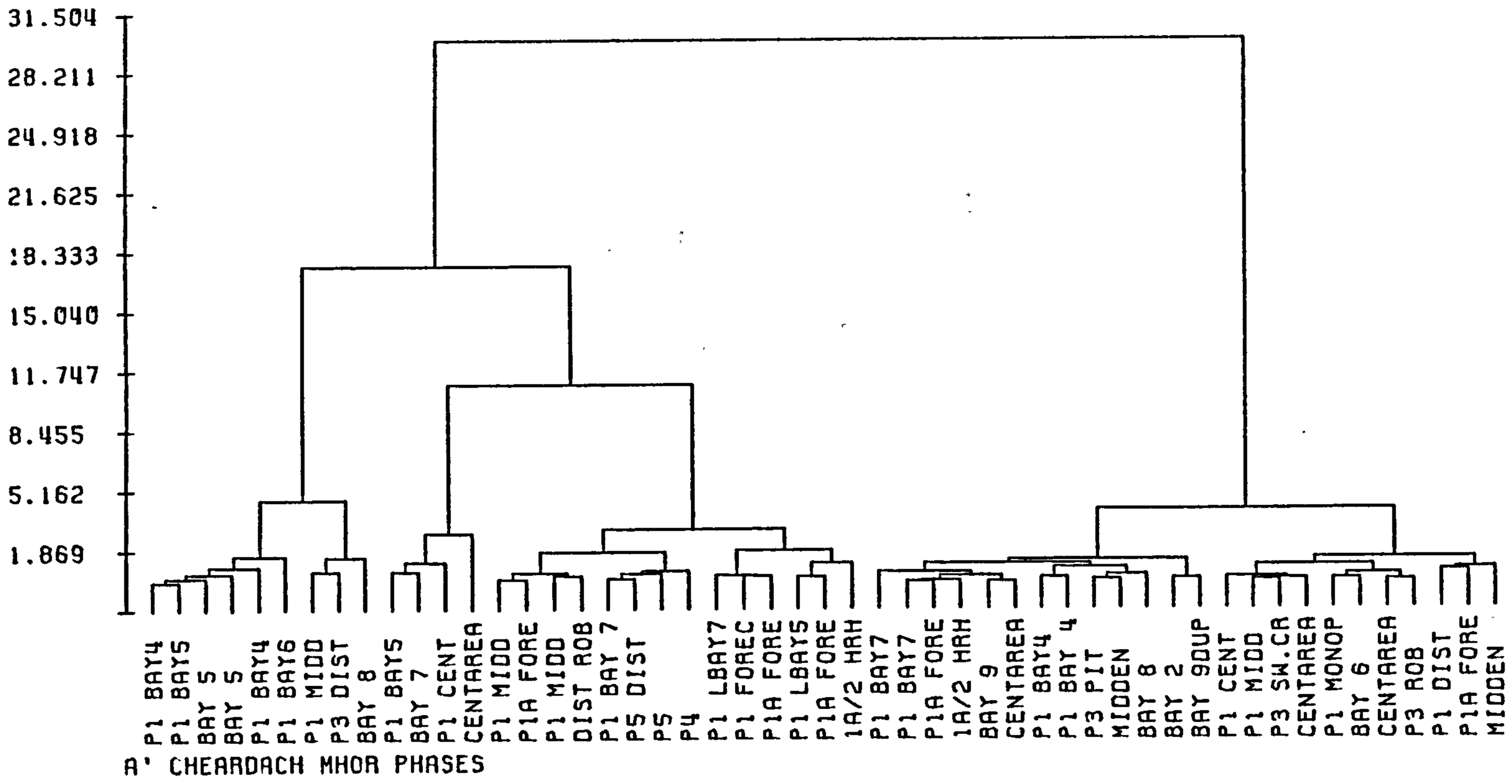


Fig. 132: Dendrogram of sampled sherds, labelled by phase and context.

A Cheardach Mhor

Cluster One: NAA samples 125, 141, 170, 162, 138 and 149. Cluster Two: NAA samples 134, 154 and 163.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	13.0	21.4	6.7	3.7	34.7	0.3
Accept Null hypo.	Yes	Yes	Yes	No	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 133.

A Cheardach Mhor

Cluster Three: NAA samples 128, 164, 145, 137.
Next closest grouping 130.....152.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	36.2	7.0	11.4	1.8	1.3	0.5
Accept Null hypo.	Yes	Yes	Yes	No	No	No

Null hypothesis: Cluster Three and the next closest grouping 130.....152 (total 14) come from the same population.

FIG. 134.

A Cheardach Mhor

Cluster Four: NAA samples 130, 171, 136, and 157. Cluster Five: NAA samples 131, 142, 153 and 159.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	6.5	44.7	1.5	14.9	87.8	9.2
Accept Null hypo.	Yes	Yes	No	Yes	Yes	Yes

Null hypothesis: Cluster Four and Cluster Five come from the same population.

FIG. 135.

A Cheardach Mhor

Cluster Six: NAA samples 132, 146 and 168.
Cluster Seven: NAA samples 139, 169 and 152.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	40.2	73.6	57.5	14.5	4.0	34.0
Accept Null hypo.	Yes	Yes	Yes	Yes	No	Yes

Null hypothesis: Cluster Six and Cluster Seven come from the same population.

FIG. 136.

A Cheardach Mhor
Cluster Four and Cluster Five: NAA samples
130, 171, 136, 157, 131, 142, 153 and 159.
Cluster Six and Cluster Seven: NAA samples
132, 146, 168, 139, 169 and 152.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	74.3	64.1	57.1	44.5	<0.0	35.6
Accept Null hypo.	Yes	Yes	Yes	Yes	No	Yes

Null hypothesis: Cluster Four and Cluster Five come from the same population as Cluster Six and Cluster Seven.

FIG. 137.

A Cheardach Mhor
Cluster Eight: NAA samples 126, 135, 166, 165, 156, 175, 127, 133, 155, 158, 176, 173 and 178.
Next closest grouping: NAA samples 129.....160 (total 11).

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	4.4	<0.0	0.1	1.3	29.1	0.56
Accept Null hypo.	No	No	No	No	Yes	No

Null hypothesis: Cluster Eight and the next closest grouping, samples 129.....160, come from the same population.

FIG. 138.

A Cheardach Mhor
Cluster Nine: NAA samples 129, 140, 161 and 148.
Cluster Ten: NAA samples 143, 167,147 and 174.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	2.3	9.8	46.8	2.7	87.2	12.9
Accept Null hypo.	No	Yes	Yes	No	Yes	Yes

Null hypothesis: Cluster Nine and Cluster Ten come from the same population.

FIG. 139.

A Cheardach Mhor
Cluster Nine and Cluster Ten: NAA samples 129, 140, 161, 148, 143, 167, 147 and 174.
Cluster Eleven: NAA samples 144, 172 and 160.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	88.8	84.0	51.8	45.7	2.7	55.3
Accept Null hypo.	Yes	Yes	Yes	Yes	No	Yes

Null hypothesis: Cluster Nine and Cluster Ten come from the same population as Cluster Eleven.

FIG. 140.

A Cheardach Mhor: Cluster number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
125	31	P1 Bay 4	everted	applied wavy cordon with double channelled arches above
141	3	P1 Bay 5	-------	applied wavy cordon, alternate hatched trianglea above
170	81	P? Bay 5	-------	wavy cordon, fingernail impress.
162	79	P? Bay 4	-------	wavy cordon
138	23	P1 Bay 4	short and bevelled	cordon effect given by two incised lines, stroke infilled
149	6	P1 Bay 6	everted lip	vertical rows of herringbone

FIG. 141.

A Cheardach Mhor: Cluster number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
134	37	P1 midden	-------	base decorated with over lapping finger tip impressions
154	196	P3 disturbed	-------	crude incised ladder pattern
163	108	P? Bay 8	-------	wavy cordon with multiple grooves above

FIG. 142.

A Cheardach Mhor: Cluster number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
128	20	P1 Bay 5	-------	sharp carination, irregular and coarse incised pattern
164	101	P? Bay 7	everted	wavy cordon, three grooved arches above
145	10	P1 cent. area blown sand	-------	lightly scratched herringbone pattern
137	62	P? cent. area	-------	wavy cordon

FIG. 143.

A Cheardach Mhor: Cluster number 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
130	7	P1 midden	-------	incised ladder pattern
171	140	P1A forecourt	-------	cross hatching
136	17	P1 midden	-------	applied boss and half a ring pin stamp made with a small pin
157	198	P? disturbed	-------	wavy cordon

FIG. 144.

A Cheardach Mhor: Cluster number 5

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
131	12	P1 Bay 7	-------	incised lattice
142	18	P5 disturbed	-------	applied boss, central dimple
153	218	P5 assoc. with bone comb	-------	outside striated
159	217	P4	-------	wavy cordon

FIG. 145.

A Cheardach Mhor: Cluster number 6

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
132	1	P1 lowest level Bay 7	inturning	incised lattice in panels above an applied wavy cordon
146	11	P1 forecourt	-------	incised lattice pattern
168	150	P1A forecourt	-------	incised lines at an angle to each other

FIG. 146.

A Cheardach Mhor: Cluster number 7

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
139	2	P1 lowest levels Bay 5	everted lip	coarsely incised lattice
169	143	P1A forecourt	-------	obliquely impressed cordon
152	188	P1A or 2 hearth 4	-------	wavy cordon

Fig. 146 A.

A Cheardach Mhor: Cluster number 8

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
126	28	P1 Bay 7 under stones	everted	wavy cordon with double finger channelled arches above
135	30	P1 Bay 7	everted	wavy cordon, triple finger channelled arches above
166	138	P1A forecourt	-------	wavy cordon
165	181	P1A or 2 hearth 4	-------	wavy cordon
156	129	P? Bay 9	-------	narrow cordon, vertically impressed, same sample as 178
175	72	P? cent. area near entrance	tall and concave	----------
127	22	P1 Bay 4	abraded	globular pot
133	5	P1 Bay 4	-------	incised pattern
155	251	P3 pit	-------	crucible with green internal deposit
158	164	P? midden	everted	wavy cordon
176	114	P? Bay 8	everted	----------
173	76	P? Bay 2	-------	wavy cordon
178	129	P? Bay 9	-------	narrow cordon, vertically impressed, same sample as 156

Fig. 146 B.

A Cheardach Mhor: Cluster number 9

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
129	8	P1 cent. area blown sand	-------	stitched pattern, also incised line with vertical strokes
140	14	P1 midden	thick and everted	double bevel with applied cordon thumbed into the neck
161	213	P3 SW corner under a stone	-------	vertically nicked cordon with incised fitted panels above
148	59	P? cent. area	-------	panel of incised lines oblique to a single straight line

FIG. 147.

A Cheardach Mhor: Cluster number 10

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
143	19	P1 monolith pit foundation	-------	thin rouleau of decoration applied in a wavy line
167	84	P? Bay 6	everted lip	finger tip and nail impressed cordon in neck
147	60	P? cent. area	-------	closely spaced herringbone
174	258	P3 blown sand	-------	metal working crucible

FIG. 148.

A Cheardach Mhor: Cluster number 11

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
144	4	P1 disturbed forecourt	-------	deeply incised pattern above an applied and pushed up band
172	134	P1A forecourt	plain	two grooved arcs on shoulder
160	169	P? midden	-------	worn cordon, above are incised triangle infilled with lines

FIG. 149.

the same sherd (NAA nos. 156 and 178). The clusters which were produced are contained in Fig. 131 along with the phase and context labels in Fig. 132. Figs. 133-140 indicate that there are 11 clusters which are identified by the 'twosample t' test. The descriptions of the sherds are contained in Figs. 141-149. There is no glaringly obvious pattern of a specific context or vessel type having a distinctive chemistry, although it might be attractive to see a trend of later contexts emerging in cluster 5 were it not for the presence of a phase 1, lattice incised sherd (Fig. 145). Cluster 8 contained both the samples taken from the single sherd and provided reassuring confirmation that the NAA technique and the statistical procedures were sufficiently sensitive to pick out real patterns within the data. As regards the rest of the sampled sherds, however, no apparent correlation can be made between the chemical groupings and those which might be defined on purely archaeological criteria.

<u>The site of A Cheardach Bheag.</u>

The wheelhouse of A Cheardach Bheag (the little smiddy) lay half a mile to the south of A Cheardach Mhor and was also one of the sites on the South Uist rocket ranges excavated on the behalf of the Ministry of Works. The excavations (Fig. 150) undertaken by Dr. Horace Fairhurst revealed the existence of three main, and two sub phases of occupation (Fig. 151), with associated artefacts and

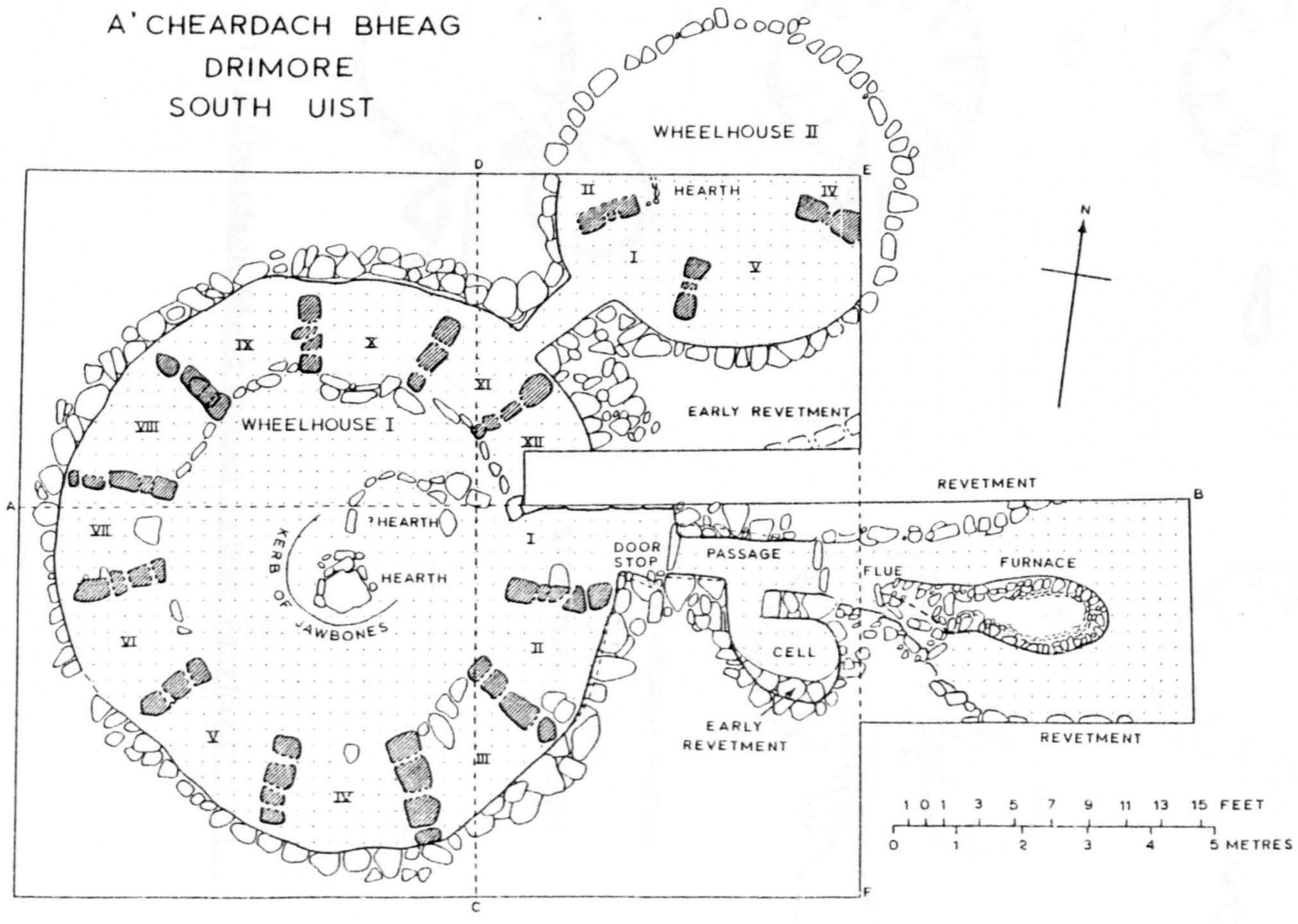


Fig. 150: A Cheardach Bheag site plan (after Fairhurst 1971).

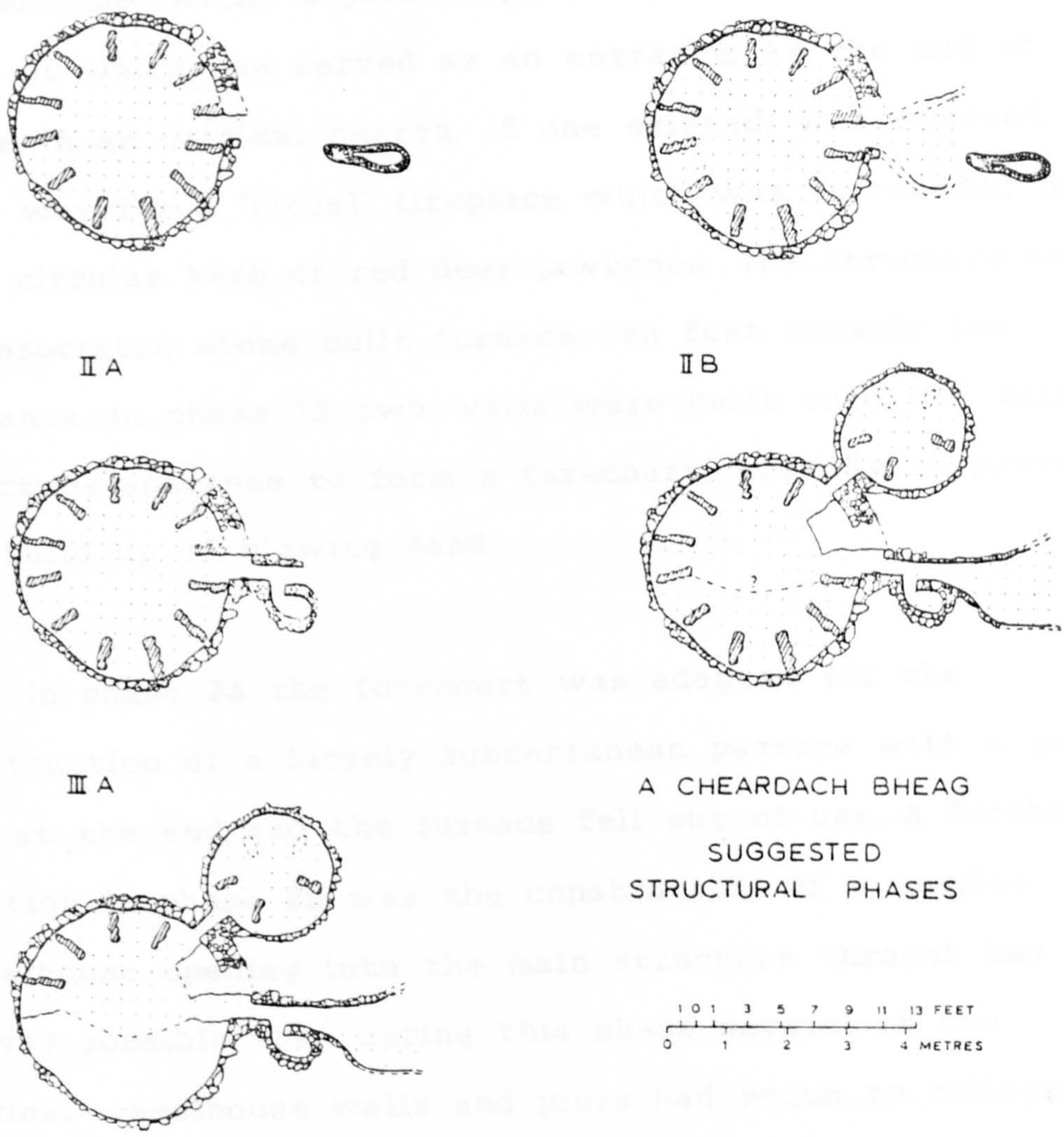


Fig. 151: A Cheardach Bheag phases (after Fairhurst 1971).

structures (Fairhurst 1971, 72-106). In phase 1A the first element of the complex, the main wheelhouse, was constructed consisting of an outer circular wall built into the flank of a sand dune, with 12 piers separating the interior into 12 bays, of which one served as an entrance. At the end of phase 1A an original hearth, if one existed, was removed to make way for a 'ritual' fireplace which was surrounded by a semi circular kerb of red deer jawbones. The structure had an associated stone built furnace ten feet outside the entrance. In phase 1B two walls were built onto the main structure entrance to form a forecourt, possibly to prevent the build up of blowing sand.

In phase 2A the forecourt was adapted for the construction of a largely subterranean passage with a guard cell at the end and the furnace fell out of use. A further addition in phase 2B was the construction of a smaller wheelhouse opening into the main structure through bay 11; it was possible that during this phase several of the original wheelhouse walls and piers had begun to collapse. Only about half of the smaller habitation was excavated, nevertheless the presence of piers also dividing the structure into bays and of a hearth was confirmed. After phase 2B the complex was abandoned for sometime before the small wheelhouse and the northern bays of the large wheelhouse were reused and reconditioned in phase 3. Finally the site was disturbed in fairly recent times for the construction of a shelter for an animal herder. The period

of the site's original usage was not closely defined by the excavator, save to say that the occupation perhaps extended over 4 centuries and was not one of the earliest of the settlements in the Hebridean group.

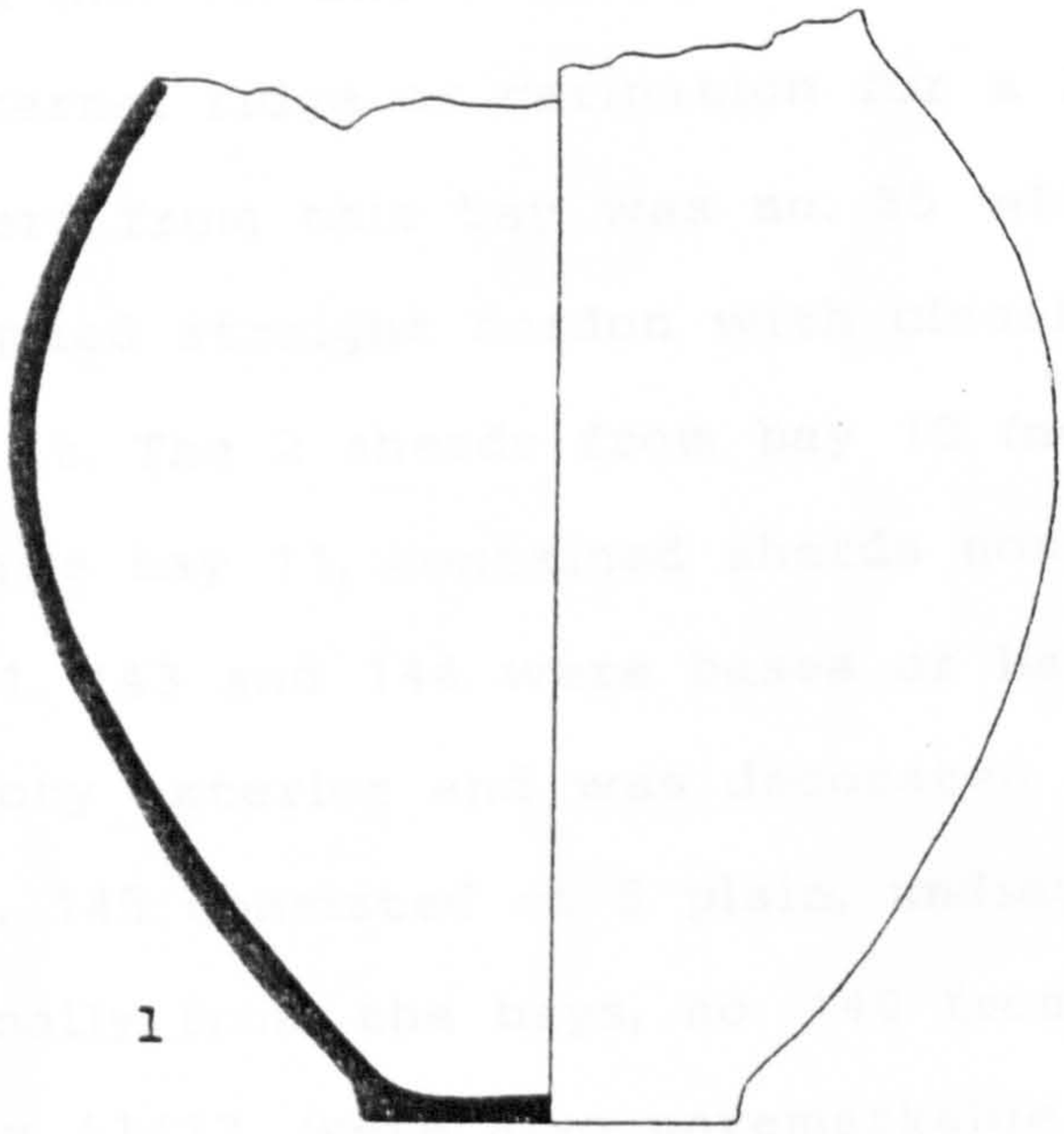
The Pottery.

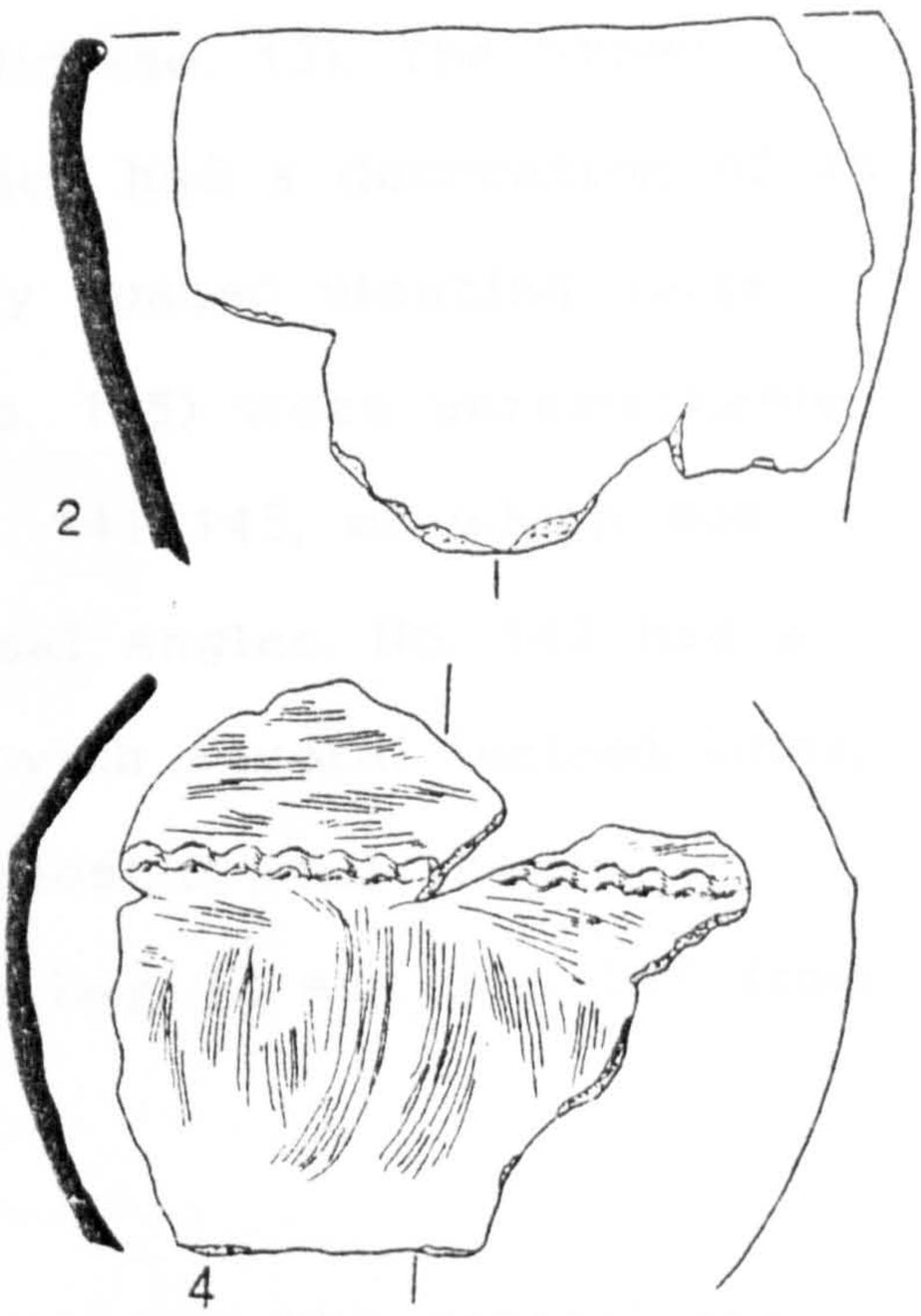
A total of some 960 sherds were recovered during the excavations, these were presented to the Hunterian Museum, Glasgow University and are described in the appendix to this chapter. Several vessels could be reconstructed wholly and several partially, so that the assemblage in the Hunterian will be treated here under 147 different sherd or vessel numbers; of these only 67 could be securely ascribed to contexts. It is unfortunate that although the contexts for these are known, the phase from which they were recovered in that context is not, so that chronological differentiation is difficult. Nevertheless, it is clear on a general basis that sherds from wheelhouse 2, for example, must be from phase 2B or later and that those from wheelhouse 1's jawbone hearth must belong to phase 1A. Thus little of a definitive nature can be stated, although it may be possible to outline broad patterns within the assemblage. The major contexts to which pottery can be ascribed are the 2 wheelhouses, the individual bays within them, the furnace and the unstratified surface layer.

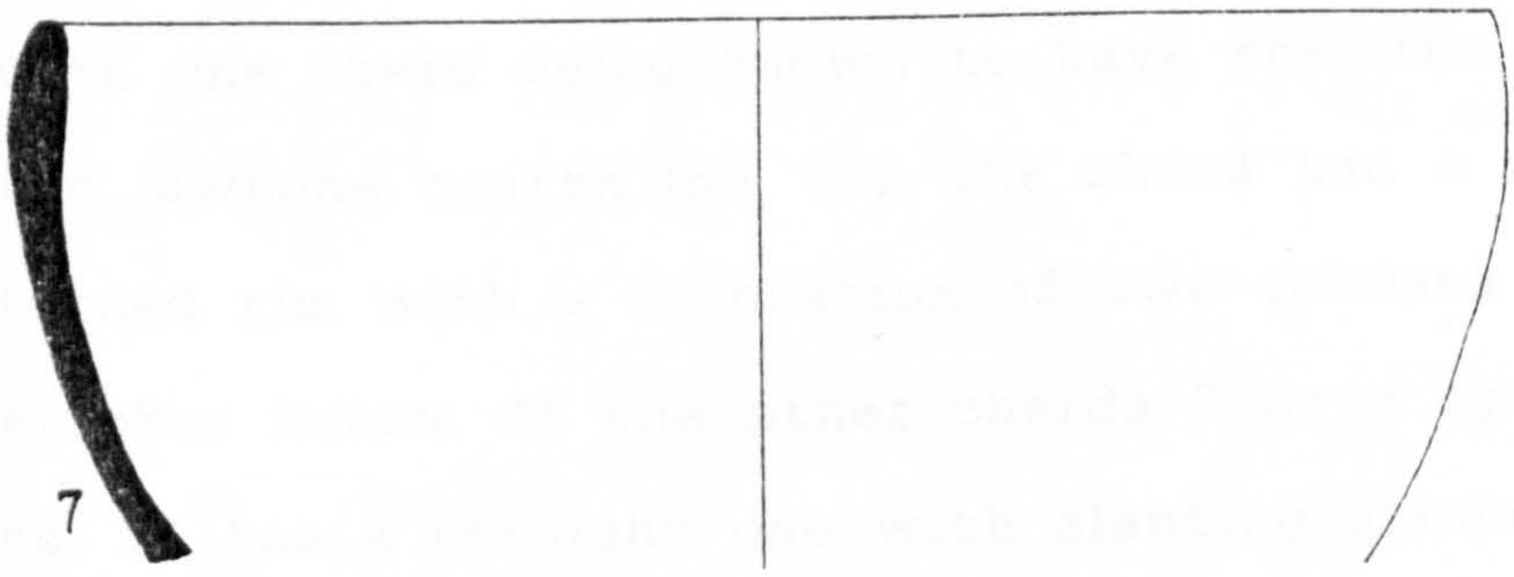
Wheelhouse 1 Pottery.

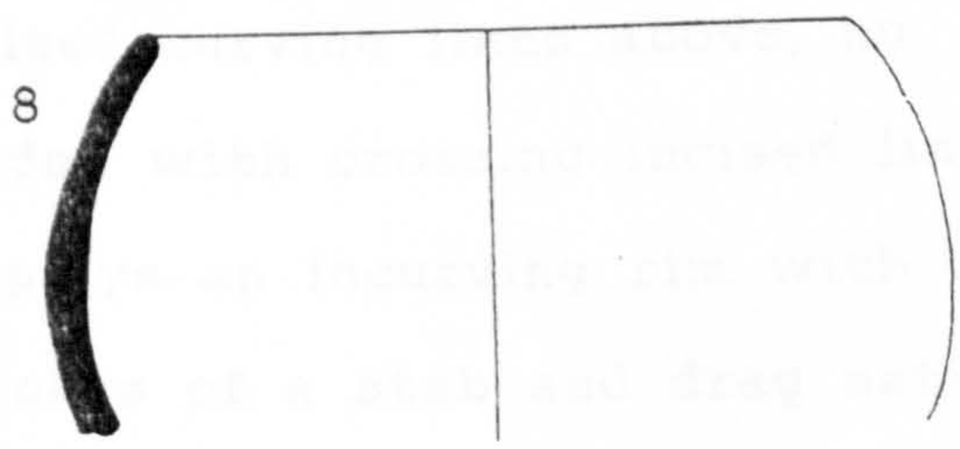
Of the sherds which do have associated contexts, none are known to have come from bays 1-4 (Fig. 152). Bay 5, however, contained numerous sherds, about a sixth of the entire assemblage and which proved enough to completely reconstruct one vessel and form parts of others. No. 1 was recovered from the aisle to this bay and was reconstructed to give a tall rounded pot with an upturned rim but no external decoration except for an adhering skin of clay still attached to the basal area. Similar thin skins of applied clay are recorded from Tigh Talamhanta, Barra, Sollas, North Uist and other Hebridean sites. No. 4, also from the aisle to bay 5, was part of a vessel from which both the rim and the base were missing. Decoration consisted of an applied wavy cordon. The other sherds from bay 5 proper displayed a variety of decorative traits including vertical strokes beneath an everted rim (no. 16), a straight cordon with vertical slashes dividing it into 'pillow' shapes with short vertical incised lines above (no. 106) and a base (Fig. 153) which had an encircling finger mark along its edge (no. 46).

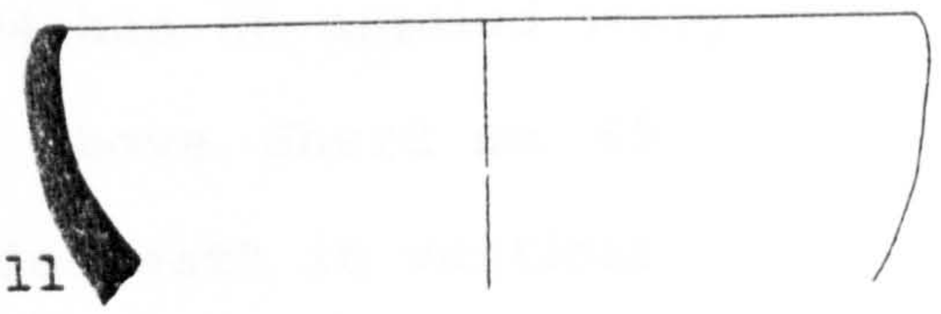
Bay 6 contained parts of 2 vessels, no. 56 was a large part of a base and no. 87 was a body sherd which had a wavy cordon with fingernail impressions in each of the upturns. No pottery is known to derive from bay 7, although parts of 3 pots came from bay 8, including the rim of a barrel shaped











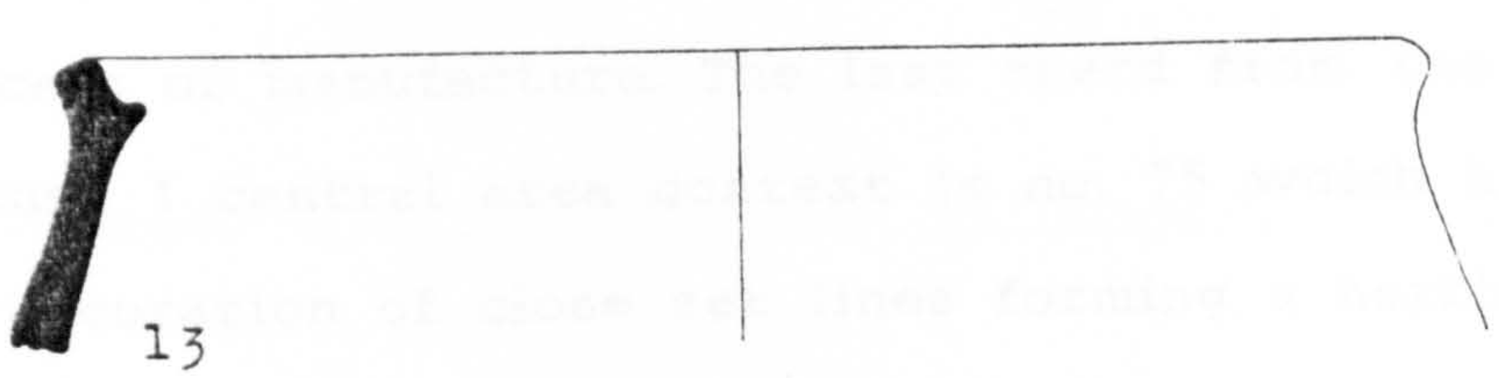


Fig. 152: A Cheardach Bheag pottery. Scale 1, 2 and 4 1:4; 7, 8, 11 and 13 1:2 (after Fairhurst 1971).

urn (no. 11) and 3 sherds from a vessel which had a distinct internal ridge or carination for a lid (no. 13). The other sherd from this bay was no. 85 which had a decoration of an applied straight cordon with closely spaced slanting nicks on it. The 2 sherds from bay 10 (no. 125) were unremarkable, while bay 11, contained sherds nos. 141-145, of which nos. 141, 143 and 144 were bases or basal angles. No. 142 had a sooty exterior and was decorated with several incised lines, no. 145 consisted of 5 plain, undiagnostic wall sherds. Finally from the bays, no. 146 from bay 12 and nos. 147 from bay 11/12, were also unremarkable.

The other wheelhouse 1 context was the central area, with one sherd being known to have specifically come from the jawbone hearth (no. 22). The sherd had a slightly out turned rim with a decoration of two columns of horizontal strokes below. Of the other sherds 2 have applied cordons, no. 94 has a straight one with slanting slashes and 2 incised curving lines above, no. 104 has an applied wavy cordon with crossing incised lines above. Sherd no. 65 displays an incurving rim with underneath it vertical strokes of a stab and drag nature, while no. 136 consists of a lump of clay with thumb prints in it, perhaps a base in the process of manufacture. The last sherd from the wheelhouse 1 central area context is no. 75 which has an incised decoration of close set lines forming a herringbone pattern.

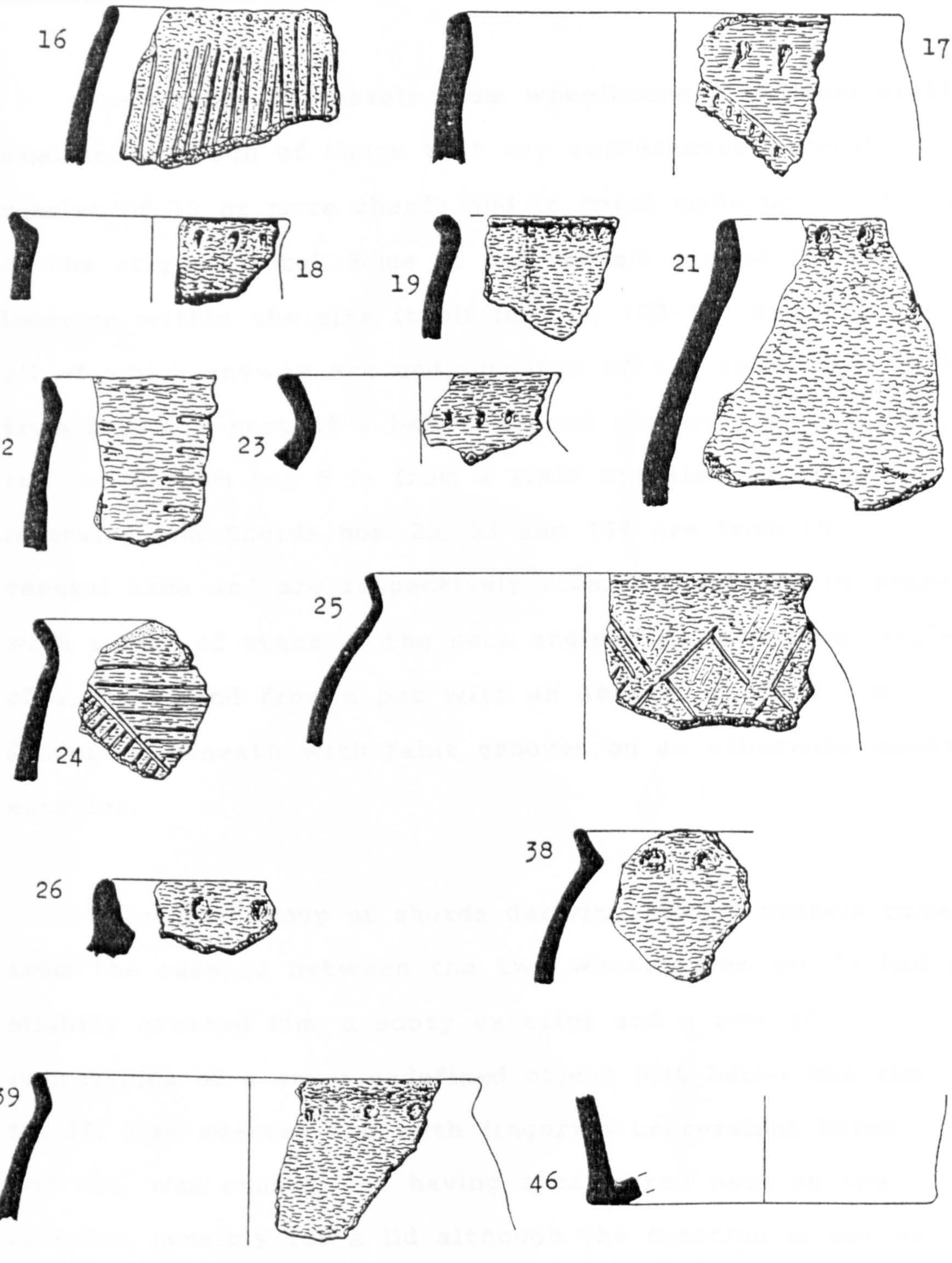


Fig. 153: A Cheardach Bheag pottery. Scale 1:2 (after Fairhurst 1971).

Wheelhouse 2 Pottery.

The number of vessels from wheelhouse 2 is considerably smaller, although of those that are represented several consist of 15 or more sherds and in total made up one tenth of the original total. Some of the vessels are no known location within the site itself (nos. 3, 130-131 and 134), all of which anyway are undiagnostic. Of the remainder no. 8 from bay 1 is part of a barrel shaped urn with an incurving rim, no. 2 from bay 5 is from a plain urn also with an incurving rim. Sherds nos. 23, 53 and 109 are from the central area and are respectively from an everted rim vessel with a row of stabs in the neck angle, from the basal angle of a vessel and from a pot with an abraded rounded rim, decorated beneath with faint grooves on an otherwise smooth exterior.

A further group of sherds deriving from 4 vessels came from the passage between the two wheelhouses. No. 21 had a slightly everted rim, a sooty exterior and a row of impressions of a small undefined object just below the rim. No. 26, also everted and with fingertip impressions below the rim, was unusual for having a carinated neck on the interior, possibly for a lid although the function is not as clear cut as that in no. 13 from wheelhouse 1. Another of the vessels represented (no. 88), was alone in having two flat applied cordons circa. 2 cm apart; unfortunately it is not illustrated in the excavation report. Not so well

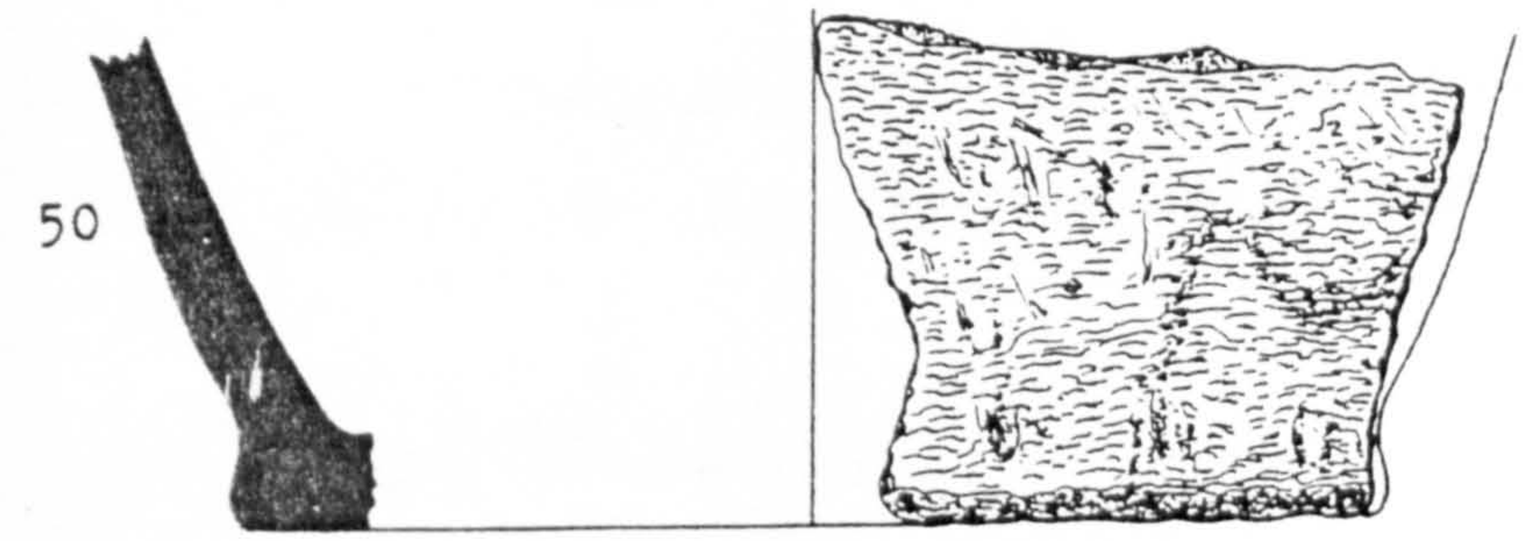


Fig. 154: A Cheardach Bheag pottery. Scale 1:2 (after Fairhurst 1971).

contexted were sherds no. 129, some 19 in total, which came from the sub surface beside the passage and of which some were brush marked and one bore an applied wavy cordon.

Pottery from the Furnace.

The structure which was identified as a furnace was associated with the larger of the wheelhouse in phase 1 and contained about a tenth of the total pottery from the site. It appears not, however, to have been a pottery kiln as there were no wasters, although vitrified lumps of clay did occur and it was thus interpreted by the excavator as having been used in metal working processes. Of the sherds known to have come from this context, all the rims were everted (nos. 24-25 and 38-39). Nos. 24 and 25 also had decoration of incised lines, in the latter consisting of overlapping chevrons forming a quadrilateral pattern. Nos. 38 and 39 were from very similar vessels, both having in addition to the everted rim a row of finger tip impressions beneath and a carination of sorts on the interior. The remainder of the sherds bore a variety of decorative features (several in Fig. 155), including incised lines forming a lattice (no. 68), incised lines forming a lattice with a thin wavy cordon (no. 96), a wavy cordon with incised lines forming a large herringbone pattern (no. 97), a complex of curving and straight incised lines (no. 99) and one sherd with a straight cordon slashed by uneven strokes (no. 84). Of the others sherds from the furnace no. 52 was a basal angle and

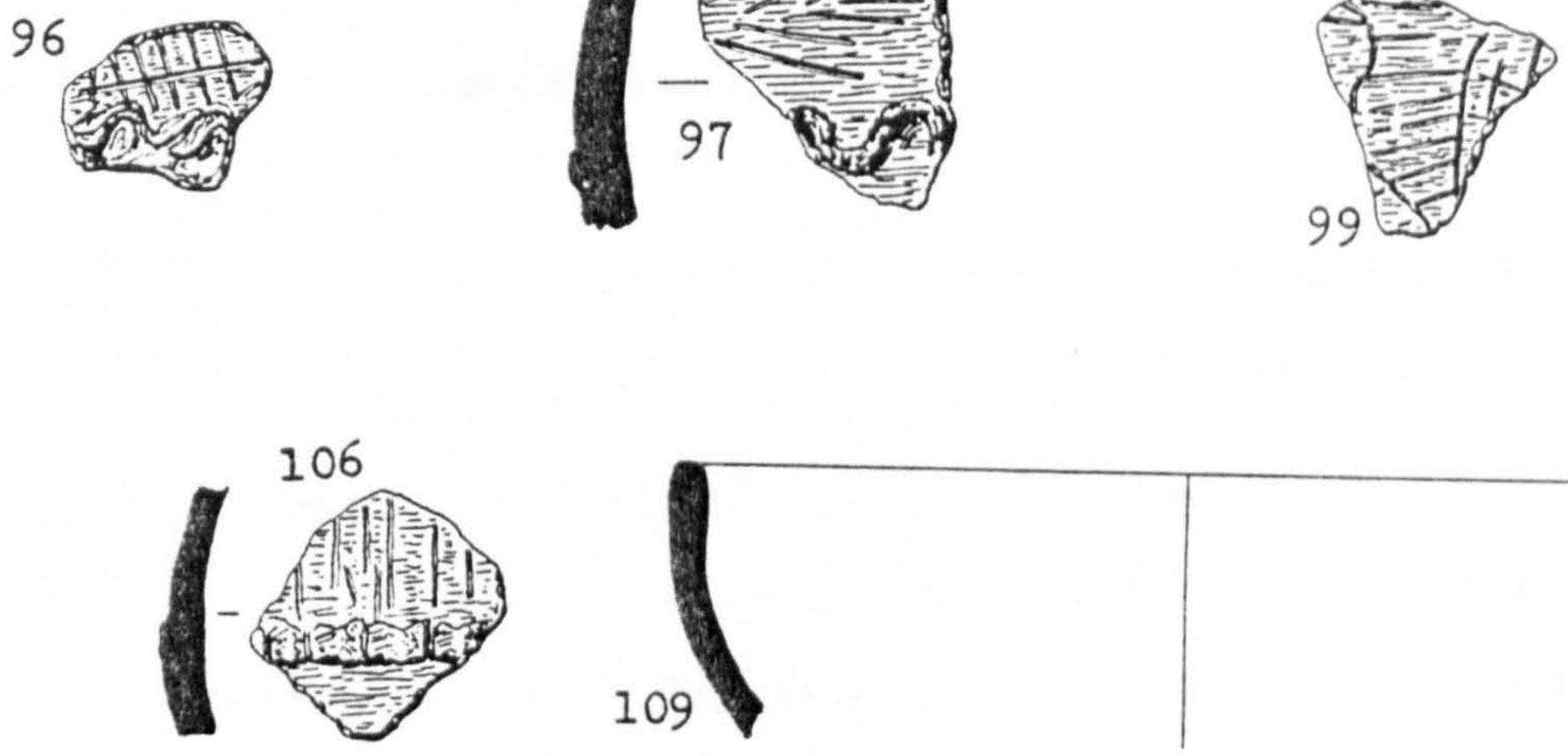


Fig. 155: A Cheardach Bheag pottery. Scale 1:2 (after Fairhurst 1971).

nos. 114 and 122 from the upper floor, strictly above the furnace, were from a thick, coarse vessel.

Pottery from the Surface Layers.

It is unfortunate that of the pottery from the surface, and therefore not strictly stratified, nearly all the sherds have distinctive or noteworthy decoration (nos. 7, 17-19, 50, 81, 93, 111 and 113). Of the rim sherds all are everted or turned out in some form, in decoration the most common form is either stabbed/impressed (nos. 17-19) or incised line (nos. 81, 93 and 111). Of the latter no. 111 is notable, in that it is clear that the basket like incised pattern forms a key onto which the thin skin of clay which covers the exterior was applied.

Miscellaneous Contexts.

Sherds nos. 72 and 74 are described as coming from the 'outer entrance', no. 72 has a faint remnant of a rolled rim with parts of 2 crudely incised ladder patterns beneath while no. 74 has a thin upcurved rim with short, vertical stab and drag marks beneath (Fig. 154). A large number of small sherds, some 57 in total (nos. 126 and 133), are labelled in the Hunterian Museum as coming from or near to the 'kiln', this is most probably the furnace, in any case only one of the number has a distinguishing feature and that is part of a lattice pattern. Sherds nos. 137-139 come from

one or other of the wheelhouses, being simply labelled 'bay' or 'aisle' 5, one of the sherds comprising no. 137 has widely spaced incised lines, the rest are plain. Two other plain sherds (no. 128) are known to have come from the forecourt, presumably of the larger wheelhouse in phase 1B and a further 52 similar sherds (no. 132) came from a context described as 'fallen stones' but otherwise of uncertain location.

Pottery from Unknown Contexts.

Of the 147 pottery numbers in the appendix for A Cheardach Bheag, the sherds belonging to 80 have no precise context or phase on the site. In general the sherds belonging to this category have similar rim types and decorative styles to those already mentioned and in the following discussion the majority will be described within general stylistic categories, with only a few being examined individually owing to their being unique or in some way different to the bulk of the assemblage. Of common decorative type are those with wavy cordons (eg. nos. 80, 82-83, 92 and 107-108), with others in addition to the cordon having incised lines forming a variety of patterns, including lattice (eg. nos. 100 and 102) and a widely spaced horizontal line decoration (no. 101). Such conjunctions of traits demonstrates the weakness of Mrs. Young's simplified chronological divisions for the Hebridean pottery sequence (Young 1966, 54-56).

A number of sherds display a plain cordon, in some cases slashed by vertical or slanting nicks, of this type are nos. 90 and 103. Others in addition to the plain or slashed cordon have incised lines above or below, on the body of the vessel, including nos. 89 and 95. Sherds which just demonstrate incised line decoration are numerous, in some case no overall pattern is obvious (eg. nos. 61-64), in others a lattice (no. 69) or a ladder figure (no. 78) may be observed. A few sherds seem to be grooved rather than incised (eg. nos. 117, 119 and 121). Of the rims the everted type is dominant (eg. nos. 27-30) with some in addition having finger tip impressions or stab marking beneath, including nos. 27 and 29. There is one example of a rolled over rim (no. 33) and one further example of a rim which has an internal ridge or carination for a lid (no. 14).

Of the sherds worthy of individual note are nos. 77 and 79. No. 79 had one long single incised line with shorter strokes coming off both sides of it at an angle to form a 'fir tree' decoration of a type common in the late post broch contexts of Dun Mor Vaul, Tiree (MacKie 1974, fig. 19). The other sherd, no. 77, is not illustrated in the excavation report even though it surely stands out by virtue of its having an impression of a circular object, perhaps a ring headed pin, despite the excavator's assurance that no such sherds occurred on the site (Fairhurst 1971, 92). As mentioned in previous chapters, ring pin stamping occurs

widely on Hebridean sites, though not in great quantity from any specific one and is a decorative technique of wide potential date.

Chronology

The excavator had difficulty in advising a date for the settlement at A Cheardach Bheag and indeed the suggested span of usage was based on a sequence which was though to be recognizable in the pottery from the site (Fairhurst 1971, 106). Suffice to say that other evidence for satisfactory dating is required, but although some few years have passed since the publication of the report, our knowledge is still not sufficient to ascribe a more confident date to the limited range of associated artefact types: Of potential value is the iron ploughshare which was recovered from bay 3 of wheelhouse 1, and to which was given Romano British date. It was then the earliest example of such an object north of the Forth and while it may be technically true to say that it still is the earliest example north of the Forth/Clyde isthmus (Alcock, 1984, 17), the 1st/2nd century AD 'cas chrom' or foot plough iron share from Leckie broch in the Upper Forth valley (MacKie, 1979, 301), cannot be ignored.

The one other recovered artefact to which a tentative date may be ascribed was the worked bone pommel from bay 5 of wheelhouse 2 (Fairhurst 1971, 100, fig. 10.1). It is of fairly small size, although on the basis of Irish examples

(Rynne 1983, 192), this would not preclude its usage with a sword of a large dagger-like form. It was admitted that it was difficult to date the swords and their associated pommels on other than typological grounds, but that the type seemed to develop in the non Roman 'Celtic fringes' of British Isles during the period of early Roman occupation, ie. during the 2nd/3rd centuries AD (Ibid, 193). Thus from the evidence of both the iron plough and the bone sword pommel, there is scope for arguing for a slightly earlier date for the settlement at A Cheardach Bheag than that proposed by the excavator.

NAA results.

The results of the cluster analysis on the 50 sampled sherds from A Cheardach Bheag are shown in Fig. 156. The dendrogram was produced from only 7 element ratios as Lu was so infrequently detected that to insert the mean Lu value into the missing cases would not have been statistically justified. The clusters from this site were in consequence not so well defined as those from other excavations and this is reflected in the relatively large number of clusters derived from only 50 samples. There is a chance that some of the clusters will contain members which do not properly belong to them and consequently less emphasis should be placed on the pottery groupings which are described. The results for the 'twosample t' tests are given in Figs. 158-167 and the cluster members in Figs. 168-182.

No regularity of context or decorative type is indicated with the identification of imported pottery or context specific traits not being possible.

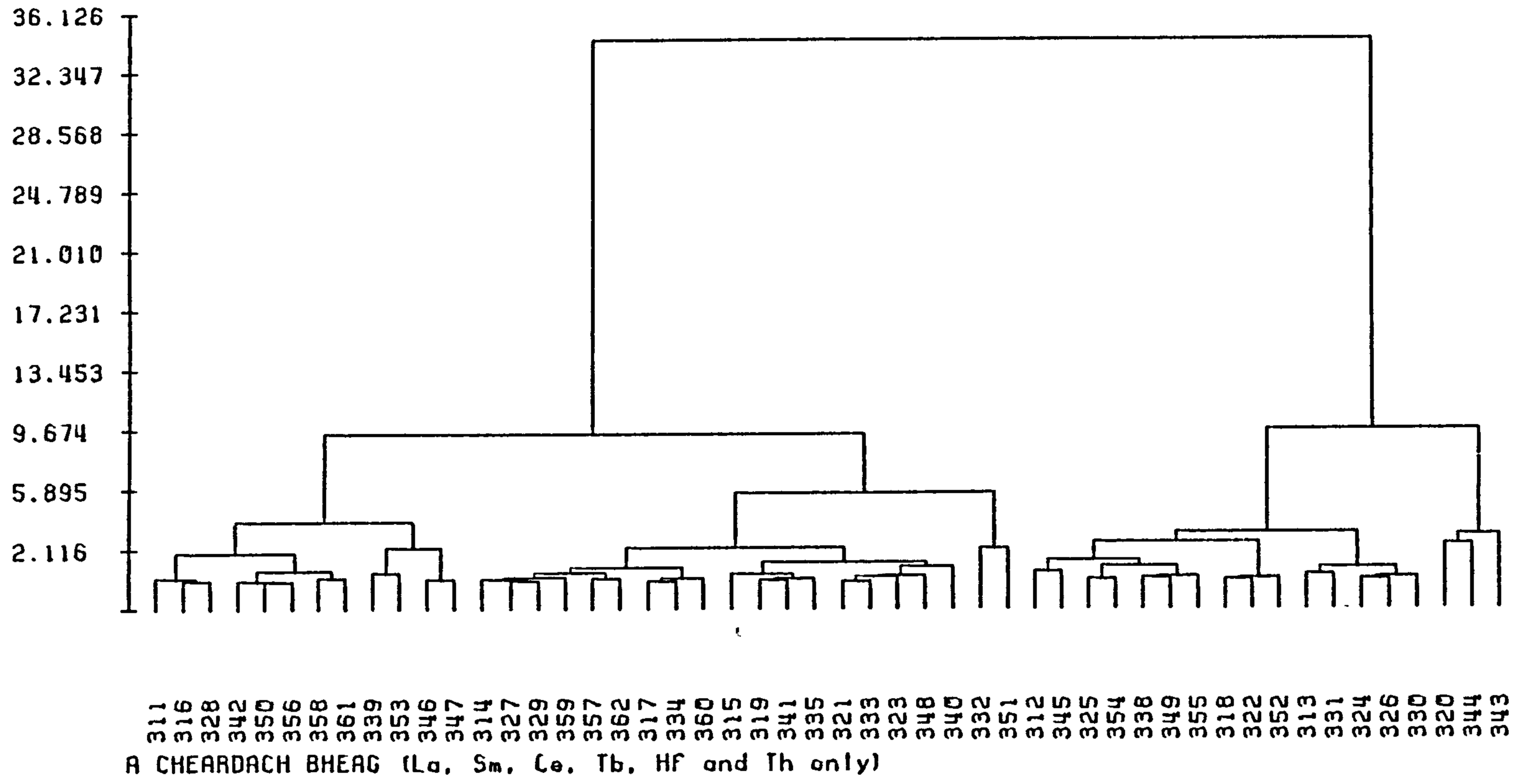


Fig. 156: Dendrogram of sampled sherds.

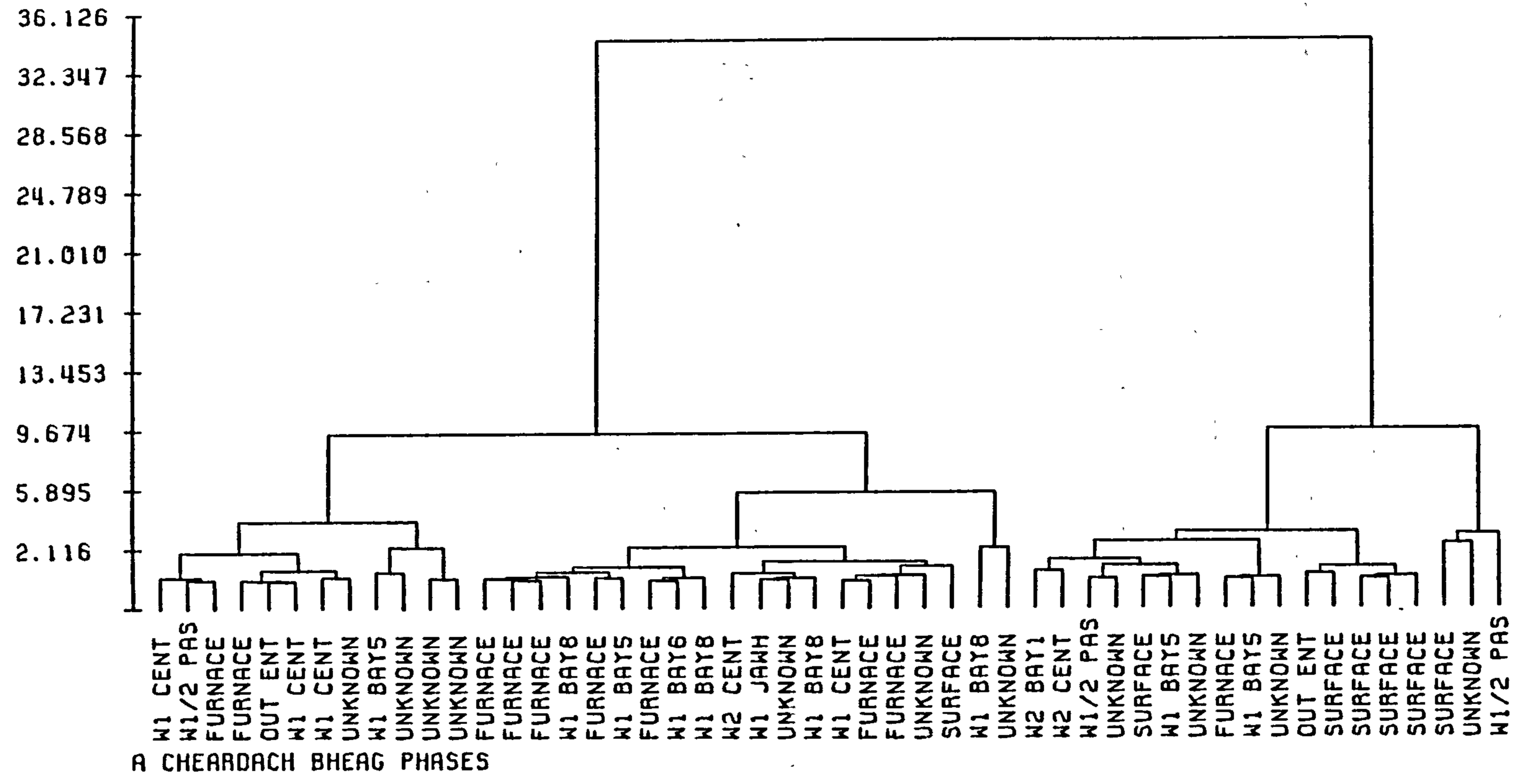


Fig. 157: Dendrogram of sampled sherds, labelled by contexts.

A Cheardach Bheag
Cluster One: NAA samples 311, 316 and 328.
Next nearest group: NAA samples 342, 350, 356, 358 and 361.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	11.0	16.9	3.7	1.2	76.6
Accept Null hypo.	Yes	Yes	No	No	Yes

Null hypothesis: Cluster One and the next nearest group come from the same population.

Fig. 158.

A Cheardach Bheag
Cluster Two: NAA samples 342, 350 and 356.
Cluster Three: NAA samples 358 and 361.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	21.5	24.8	4.1	38.8	59.5
Accept Null hypo.	Yes	Yes	No	Yes	Yes

Null hypothesis: Cluster Two and Cluster Three come from the same population.

Fig. 159.

A Cheardach Bheag
Cluster One, Cluster Two and Cluster Three: NAA samples 311, 316, 328, 342, 350, 356, 358 and 361. Cluster Four: NAA samples 339, 353, 346 and 347.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	38.5	<0.0	33.7	10.8	66.7
Accept Null hypo.	Yes	No	Yes	Yes	Yes

Null hypothesis: Cluster One, Cluster Two and Cluster Three come from the same population as Cluster Four.

Fig. 160.

A Cheardach Bheag
Cluster One, Cluster Two, Cluster Three and Cluster Four. Nearest group: NAA samples 314.....351.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	32.3	<0.0	77.2	41.7	5.7
Accept Null hypo.	Yes	No	Yes	Yes	Yes

Null hypothesis: Cluster One, Cluster Two, Cluster Three and Cluster Four come from the same population as the next nearest grouping 314.....351.

Fig. 161.

A Cheardach Bheag
Cluster Five: NAA samples 314, 327, 329, 359, 357 and 362. Cluster Six: NAA samples 317, 334 and 360.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	7.1	3.2	4.7	24.8	38.8
Accept Null hypo.	Yes	No	No	Yes	Yes

Null hypothesis: Cluster Five and Cluster Six come from the same population.

Fig. 162.

A Cheardach Bheag
Cluster Seven: NAA samples 315, 319, 341 and 335. Cluster Eight: NAA samples 321, 333, 323, 348 and 340.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	91.0	68.4	46.5	0.1	96.0
Accept Null hypo.	Yes	Yes	Yes	No	Yes

Null hypothesis: Cluster Seven and Cluster Eight come from the same population.

Fig. 163.

A Cheardach Bheag
Cluster Nine: NAA samples 312 and 345.
Cluster Ten and Cluster Eleven: NAA samples 325, 354, 338, 349 and 355.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	11.2	1.6	22.2	5.6	39.4
Accept Null hypo.	Yes	No	Yes	Yes	Yes

Null hypothesis: Cluster Nine comes from the same population as Cluster Ten and Eleven.

Fig. 164.

A Cheardach Bheag
Cluster Ten: NAA samples 325 and 354.
Cluster Eleven: NAA samples 338, 349 and 355.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	63.5	1.0	57.6	8.8	23.1
Accept Null hypo.	Yes	No	Yes	Yes	Yes

Null hypothesis: Cluster Ten and Cluster Eleven come from the same population.

Fig. 165.

A Cheardach Bheag
Cluster Nine, Cluster Ten and Cluster Eleven: NAA samples 312, 345, 325, 354, 338, 349 and 355. Cluster Twelve: NAA samples 318, 322 and 352.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	2.1	0.1	4.8	67.6	2.0
Accept Null hypo.	No	No	No	Yes	No

Null hypothesis: Cluster Nine, Cluster Ten and Cluster Eleven come from the same population as Cluster Twelve.

Fig. 166.

A Cheardach Bheag
Cluster Nine, Cluster Ten, Cluster Eleven and Cluster Twelve: NAA samples 312.....352. Cluster Thirteen: NAA samples 313, 331, 324, 326 and 330.

Element	La	Sm	Ce	Hf	Th
Two sample T test P.	87.0	44.9	36.4	12.7	1.5
Accept Null hypo.	Yes	Yes	Yes	Yes	No

Null hypothesis: Cluster Nine, Cluster Ten, Cluster Eleven and Cluster Twelve come from the same population as Cluster Thirteen.

Fig. 167.

A Cheardach Bheag: Cluster number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
311	75	W1 cent. area	-------	zigzag lines forming chevrons
316	26	W 1/2 passage	everted carinated	finger tip impressions on the rim flange
328	24	Furnace	everted	complex of incised lines at angles to each other

Fig. 168.

A Cheardach Bheag: Cluster number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
342	52	Furnace	-------	base sherd
350	74	Outer entrance	thin and upcurved	stab and drag strokes under rim
356	65	W1 cent. area	incurved	vertical stab and drag strokes

Fig. 169.

A Cheardach Bheag: Cluster number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
358	104	W1 cent. area	-------	wavy cordon and incised lines crossing each other
361	103	Unknown	plain	----------

Fig. 170.

A Cheardach Bheag: Cluster number 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
339	16	W1 bay5	everted	vertical strokes beneath the rim
353	80	Unknown	-------	plain cordon with vertical impressions on it
346	98	Unknown	-------	wavy cordon with part of an incised ladder pattern above
347	69	Unknown	-------	incised lattice effect

Fig. 171.

A Cheardach Bheag: Cluster number 5

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
314	68	From furnace	-------	incised lattive effect
327	84	From furnace	-------	wavy cordon with vertical impressions on it
329	96	From furnace	-------	thin wavy cordon with part of a lattice beneath
359	13	W1 bay 8	out turned	lid ridge at rim interior
357	39	From furnace	everted and carinated	finger tip impressions in a row beneath the rim
362	4	W1 aisle bay 5	-------	wavy cordon

Fig. 172.

A Cheardach Bheag: Cluster number 6

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
317	99	From furnace	-------	curved and straight incision
334	87	W1 bay 6	-------	wavy cordon with vertical nicks
360	11	W1 bay 8	incurving	----------

Fig. 173.

A Cheardach Bheag: Cluster number 7

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
315	23	W2 cent. area	everted	row of stabs in neck angle
319	22	W1 jawbone h.	slightly everted	column of horizontal strokes beneath the rim
341	102	Unknown	-------	worn wavy cordon with crossing incised lines above
335	85	W1 bay 8	-------	cordon slashed by closely spaced incised lines

Fig. 174.

A Cheardach Bheag: Cluster number 8

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
321	94	W1 cent. area	-------	cordon with slanting nicks and two thin arched lines above
333	38	From furnace	everted and carinated	faint finger tip impressions below rim
323	25	From furnace	everted	complex of incised lines forming chevrons
348	101	Unknown	-------	thick wavy cordon, widely spaced incised lines
340	50	Surface	-------	base with slightly projecting foot, thumb impressions on ext.

Fig. 175.

A Cheardach Bheag: Unassigned Cluster 5, 6, 7 or 8

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
332	13	W1 bay 8	out turned	lid ridge on interior
351	86	Unknown	-------	thick wavy cordon

Fig. 176.

A Cheardach Bheag: Cluster 9

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
312	8	W2 bay 1	incurving	grass marked
345	53	W2 cent. area	-------	basal angle

Fig. 177.

A Cheardach Bheag: Cluster 10

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
325	21	W1/2 passage	slightly everted	impressions of a small object below the rim
354	79	Unknown	-------	incised lines of 'fir tree' type

Fig. 178.

A Cheardach Bheag: Cluster 11

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
338	7	Surface	rounded	grass marked
349	46	W1 bay 5	-------	basal angle, encircling finger mark
355	15	Unknown	flattened	----------

Fig. 179.

A Cheardach Bheag: Cluster 12

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
318	97	From furnace	-------	wavy cordon with zigzag lines
322	106	W1 bay 5	-------	flat 'cushion' cordon with vertical incised lines above
352	31	Unknown	plain	----------

Fig. 180.

A Cheardach Bheag: Cluster 13

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
313	72	Outer entrance	rolled out	two ladder patterns meet in an elbow
331	93	Surface	slightly everted	very thin wavy cordon, parallel vertical zigzag lines above
324	17	Surface	slightly everted	stabs beneath rim and curved incised lines
326	19	Surface	everted	finger tip marks below rim
330	81	Surface	-------	smooth wavy cordon

Fig. 181.

A Cheardach Bheag: Unassigned Cluster 9, 10, 11, 12 or 13

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
320	18	Surface	thin lip, everted	stabs beneath the rim
344	78	Unknown	-------	incised lines in a ladder effect
343	88	W1/2 passage	-------	two flat cordons c. 2cm apart

Fig. 182.

Chapter seven: North Uist.

'Such a country has an amazing number of those defensive points, which suited the genius of fortification in mediaeval and prehistoric times'.
(Thomas 1890, 399).

Geological Background.

The underlying solid geology of North Uist is similar to the rest of the Hebridean chain being composed of Lewisian gneisses (Phemister 1948, Plate II). Most of the rocks are of igneous origin with the prevalent types containing the minerals biotite and hornblende the more basic varieties containing pyroxene (Peach and Horne, 1930, 63). On the west side of the island there occur pink acid gneisses resembling pegmatites with other localities having intrusions of ultrabasic material. The band of crushed material occurring in the islands to the south extends into North Uist and is associated in the east of the island with the Outer Isles Thrust Plane (Smith and Fettes 1979, fig. 2). Along the plane the dense black flinty rocky pseudotachylyte was formed which when molten fused together the adjacent more friable gneiss and created a rock more resistant to weathering giving rise to the prominent hills of the east coast, such as Eaval.

The nature of the glaciation of North Uist is open to the same debate as that relating to South Uist; namely whether the ice flows were from the mainland or to whether a local ice cap existed on the islands. Of great relevance

also for archaeological investigation are the factors affecting the deposition and change of the machair landscape. It is clear in North Uist, as it was in South Uist, that the rise in sea level which facilitated the original formation of the machair, is a continuing process, with many of the later prehistoric structures either being flooded in their lower levels or being eroded by the encroaching sea, with the Vallay Strand area and Baleshare being examples (Ritchie 1979, 115).

A total of 4 locations in North Uist were sampled for clays to be analysed by x-ray diffraction and NAA; all were from near sites that themselves been chosen for pottery analysis, namely Balelone, Sollas, Foshigarry and Clettraval. The Balelone and Sollas samples were from grey and very gritty beds of clay and contained the minerals albite, tremolite, quartz, chlorite, muscovite and potasssium feldspar. The Foshigarry and Clettraval samples were both less plastic in consistency and contained decayed rock fragments. They contained a generally similar mineral composition to the above, though in addition both had montmorillonite, a clay mineral which is prone to shrinkage. The 4 samples are not thus outstandingly obvious sources of raw material for pottery production, though this is not to say they were not utilised.

<u>History of Archaeological Investigation.</u>

At the end of the 17th century the existence of prehistoric forts constructed on rocky knolls, or as island duns in the midst of the fresh water lochs in North Uist was already recorded (Martin 1716, 58). Captain Thomas included two of them, Dun Ban, Grimsay and Dun Torcuill, Loch Mearral in his classification of the small forts of the Western Isles and ventured to excavate upon the former, recovering sherds of pottery and evidence of habitation (Thomas 1890, 401-402). It was not until 1911, however, before a more systematic survey of the prehistoric and historic antiquities of the island was published by Erskine Beveridge. He had undertaken the survey to contrast the structures with those on which he had reported on the islands of Coll and Tiree some eight years previously (Beveridge 1903). The work on North Uist, which was published in 1911, was comprehensive and concerned with antiquities of prehistoric and mediaeval date, including many of those which were to become the focus of later excavations. The site of Foshigarry was not surveyed as it was not discovered until the year of publication of North Uist. It became one of the sites which Beveridge himself was to excavate during the period prior to and immediately after the First World War and the report was published following his death in 1919 (Beveridge 1931), with a comment on some of the finds recovered prepared by Graham Callander (1931).

The site of Foshigarry.

The excavations conducted by Erskine Beveridge demonstrated that the site of Foshigarry had been occupied by a group of no fewer than six subterranean structures, of which five were contiguous and apparently accessible to each other. From the plan prepared by him (Fig. 183) it can be seen that these structures were already being eroded by the sea. It would seem, however, that he was correct in drawing analogies to better preserved wheelhouses, such Cnoc a Comhdhalach also on North Uist. The six structures labelled by him 'A' to 'F' represent two separate occupations, spatially and perhaps chronologically as well, with structure 'A' being the remains of half a wheelhouse and the remaining cells 'B' to 'F' forming a separate complex of two wheelhouses and associated structures. It is this latter complex which seems to have undergone the greatest disturbance, with a modern period dwelling having been constructed upon the summit of the mound underneath which the prehistoric remains lay. There is also evidence of prehistoric disturbance with perhaps the building of an underground passage of souterrain type (structure 'H'). The interpretation of the finds, including the pottery is hindered by the combination of the contemporary standard of excavation, the complexity of the site's structures and the death of the excavator, all resulting in a lack of precise contexts for many of the artefacts.

<u>The Pottery.</u>

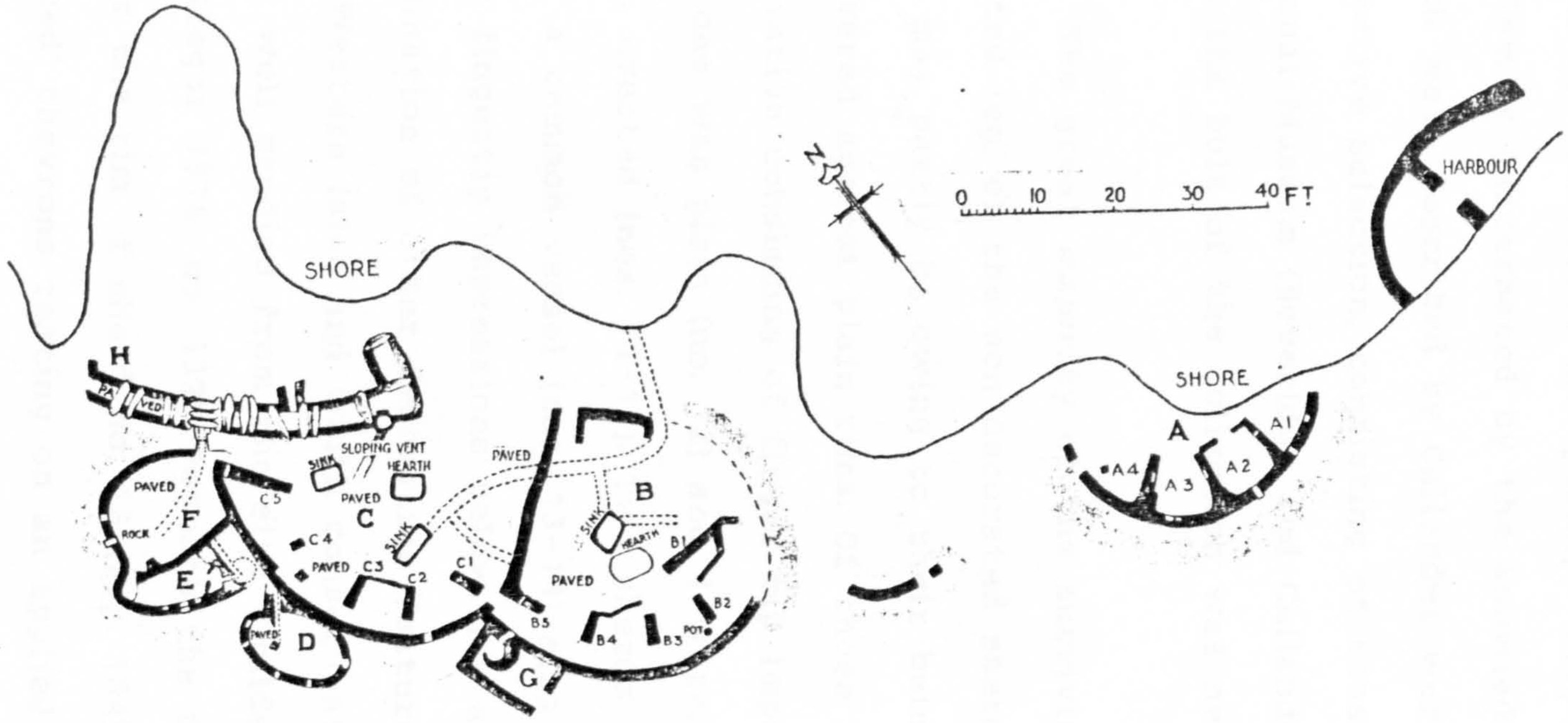


Fig. 183: Foshigarry site plan (after Callander 1931).

In effect very few of the sherds from the site can be assigned to any context, they may indeed by doubts that all of it is prehistoric. For this reason the pottery will be discussed by decoration or rim type, although it is recognized that it is just this sort of subjective approach which has dominated and perhaps misguided the past. The problem is exacerbated by the knowledge that the sherds which were described by Callander were themselves a subjective selection, consisting of those presented to the National Museum (Beveridge and Callander, 1931, 343,) and that the bulk of the collection was never properly recorded.

The great majority of the surviving rim sherds are everted (eg. of the non decorated sherds nos. 2 and 5-6), this may partly be owing to their being selectively recovered against plain rims. Of those rim sherds with decoration consisting of finger tip impressions below the rim, one was plain (no. 12) and 4 were, or appeared to have been, everted (nos. 14-18). Two sherds which probably derive from a common vessel (nos. 13-14) also have an everted rim with fingertip impressions below. Inn addition they have a combination of other decorative features which are unique in the Western Isles and which consequently have made them the most well studied from the site (Childe 1935, pl. XVI, b; MacGregor 1976, no. 332). Beneath the fingertip impressions under the rim of sherd no. 13 (Fig. 184) are groups of 'nested' chevrons resting on an applied wavy cordon, with

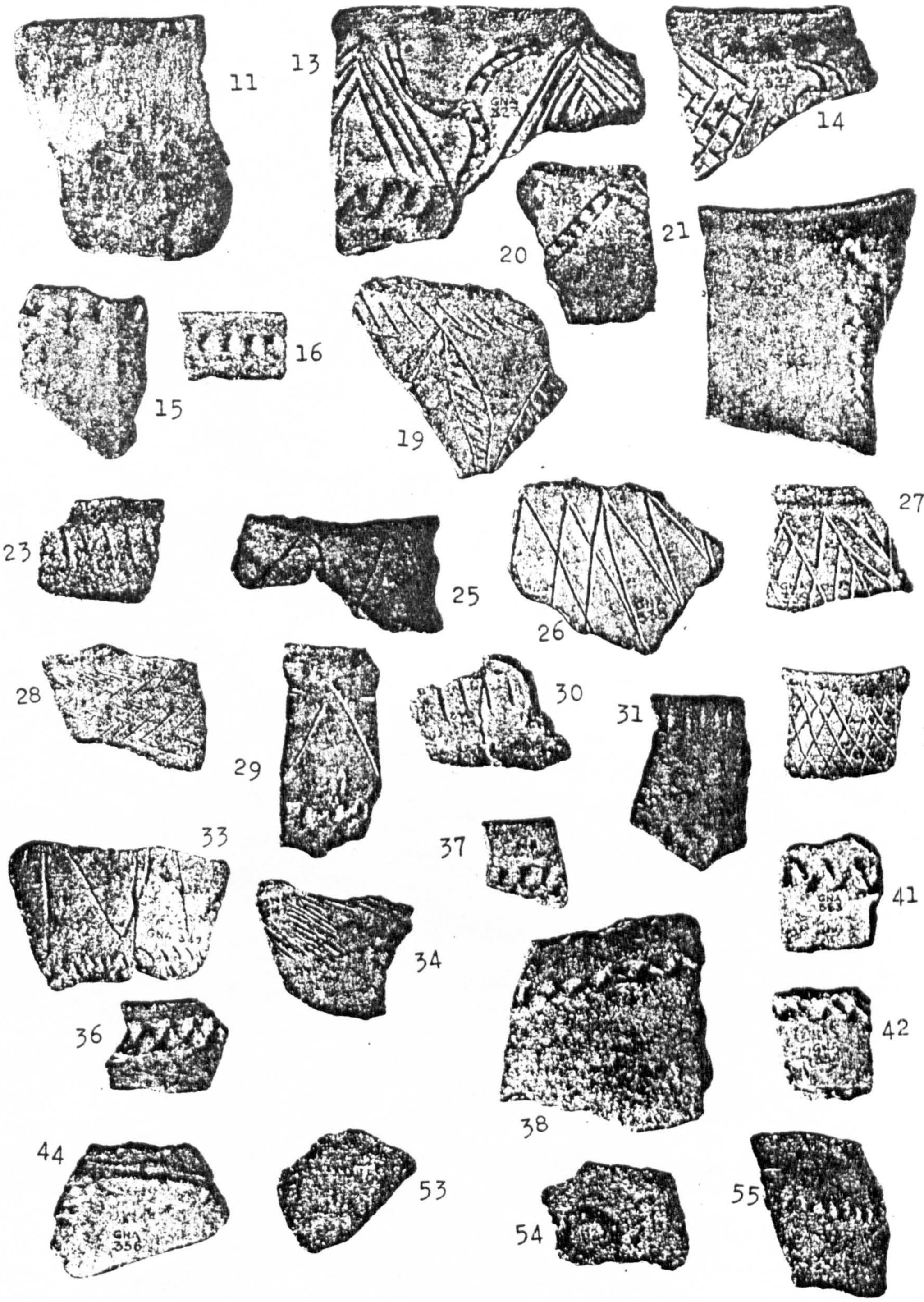


Fig. 184: Foshigarry pottery. Scale 1:2.5 (after Callander 1931).

the space between the groups of chevrons being infilled by a three legged incised triskele pattern. Sherd no. 14 has parts of an incised lattice pattern instead of chevrons but the similarity of rim and fabric make it likely that it derives from the same vessel.

The presence of a combination of decorative traits on any one sherd make the allocation of that sherd to a grouping difficult, as one person may consider the cordon type the predominant feature, another the incised line pattern. Thus the following groupings are open to change according to which decorative feature is being considered. Sherds with wavy cordons include nos. 38, 41 and 63 with nos. 42 and 58 and having two thin wavy cordons circa 3 and 4 cm apart. Sherd no. 73 displayed a very heavy cordon deeply indented with finger tip impressions (Fig. 185). Sherds nos. 36-40 have an applied wavy cordon in the neck of the everted rim. Other sherds have plain cordons with vertical or diagonal slashes, such as nos. 74, 76-78 and 81-82, no. 44 has a smooth plain and straight cordon, while yet others have simulated cordons created by horizontal rows of slanting nicks on the body of the vessel, for example nos. 33 and 86.

Many of the surviving sherds have incised decoration of a wide variety of types, indeed almost representative of the entire range within the whole Hebridean Island chain. Several general motifs can be outlined, for example, the

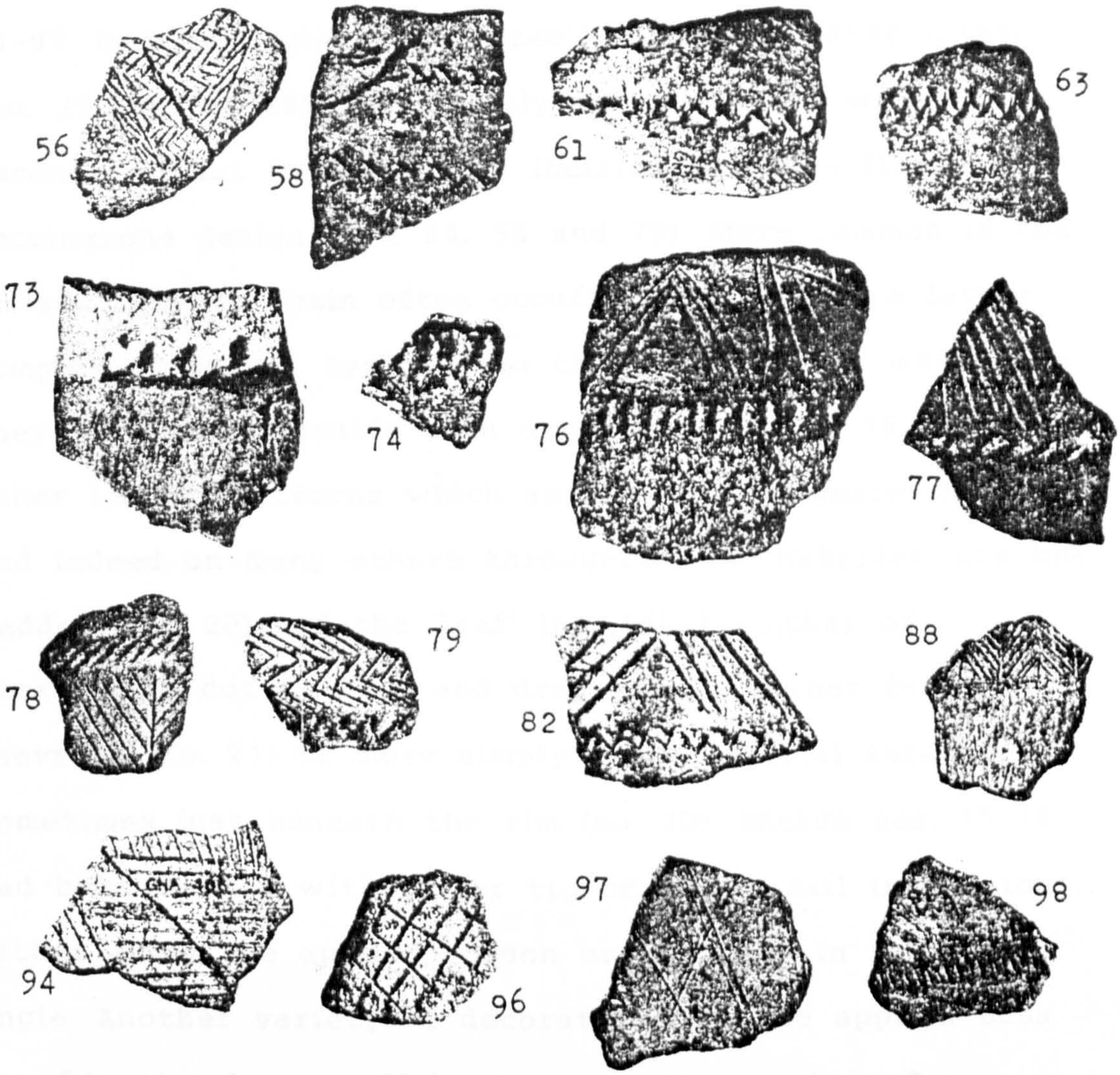


Fig. 185: Foshigarry pottery. Scale 1:2.5 (after Callander 1931).

portions of incised lattice visible on nos. 14, 32 and 94-97. Others display a 'fir tree' or feather pattern (eg. nos. 27, 78 and 88), occasionally in conjunction with cordons, whilst in others the incision adopts a fine herringbone design (nos. 28, 56 and 79). More common is the incised chevron again often occurring as part of a larger complex of design, typically in the 'nested' form where the chevrons are set inside each other (nos. 12-13, 76 and 82). Other incised patterns which appear on Foshigarry sherds, and indeed on many others throughout the Hebrides, are the 'ladder' (no. 20) and the 'leaf' (no. 14). A number of vessels had dot or stab and drag motifs, either forming chevrons (no. 21) or more simply short vertical strokes, sometimes just beneath the rim (no. 30). Sherds nos. 15-18 had been marked with finger tip or finger nail impressions, either along the applied cordon or in a row in the neck angle. Another variety of decoration was the applied boss (no. 54), this has parallels at many sites such as Dun Cuier, Barra.

Chronology.

One of the drawbacks to a fuller discussion of the material is that only one vessel can now be given a context, no. 105 which was a large cordoned jar recovered from wheelhouse 'B'. This has the consequence that no chronological framework for the pottery designs can be deduced from the site; especially frustrating since so many

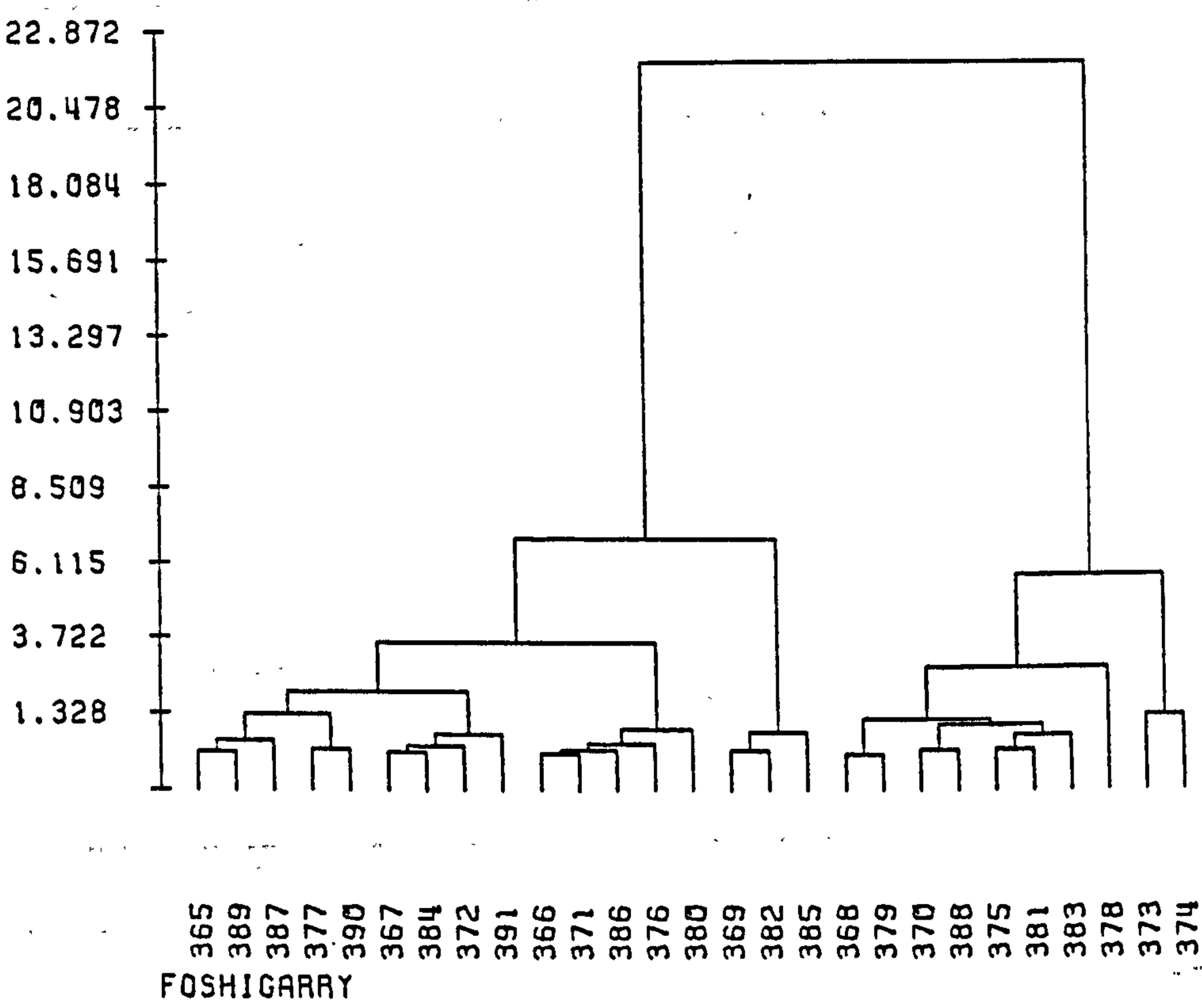


Fig. 186: Dendrogram of sampled sherds.

Foshigarry

Cluster One: NAA samples 365, 389 and 387.
Cluster Two: NAA samples 377 and 390.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	27.1	36.8	2.2	1.8	2.6	8.4
Accept Null hypo.	Yes	Yes	No	No	No	Yes

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 187.

Foshigarry

Cluster One and Cluster two: NAA samples 365, 389, 387, 377 and 390. Cluster Three: NAA samples 367, 384, 372 and 391.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	2.7	26.4	0.3	12.1	22.0	2.6
Accept Null hypo.	No	Yes	No	Yes	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population as Cluster Three.

Fig. 188.

Foshigarry

Cluster One, Cluster Two and Cluster Three: NAA samples 365, 389, 387, 377, 390, 367, 384, 372 and 391. Cluster Four: NAA samples 366, 371, 386, 376 and 380.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	1.5	14.5	1.4	10.1	42.0	8.4
Accept Null hypo.	No	Yes	No	Yes	Yes	Yes

Null hypothesis: Cluster One, Cluster Two and Cluster Three come from the same population as Cluster Four.

Fig. 189.

Foshigarry

Cluster One, Cluster Two, Cluster Three and Cluster Four: NAA samples 365, 389, 387, 377, 390, 367, 384, 372, 391, 366, 371, 386, 376 and 380. Cluster Five: NAA samples 369, 382 and 385.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	2.0	4.3	0.6	0.2	1.1	1.1
Accept Null hypo.	No	No	No	No	No	No

Null hypothesis: Cluster One, Cluster Two, Cluster Three and Cluster Four come from the same population as Cluster Five.

Fig. 190.

Foshigarry

Cluster Six: NAA samples 368 and 379. Cluster Seven: NAA samples 370, 388, 375, 381 and 383.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	9.4	32.7	19.3	5.5	56.1	3.4
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	No

Null hypothesis: Cluster Six and Cluster Seven come from the same population.

Fig. 191.

Foshigarry

Cluster Six, Cluster Seven and outlier 378: NAA samples 368, 379, 370, 388, 375, 381, 383 and 378. Cluster Eight: NAA samples 373 and 374.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	16.9	3.2	12.3	<0.0	72.2	<0.0
Accept Null hypo.	Yes	No	Yes	No	Yes	No

Null hypothesis: Cluster Six, Cluster Seven and outlier 378 come from the same population as Cluster Eight.

Fig. 192.

Foshigarry: Cluster 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
365	76	Unknown	-------	cordon with deep vertical nicks and above 'nested' chevrons
389	58	Unknown	-------	two thin applied wavy cordons
387	36	Unknown	everted	wavy applied cordon in neck

Fig. 193.

Foshigarry: Cluster 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
377	33	Unknown	broken off	slanting nicks below the rim and beneath that incised chevrons
390	44	Unknown	-------	applied plain cordon

Fig. 194.

Foshigarry: Cluster 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
367	53	Unknown	-------	very thin cordon with closeset transverse nicks on it
384	97	Unknown	-------	lightly incised lines forming a large lattice pattern
372	73	Unknown	-------	thick applied cordon with deep fingernail nicks on it
391	61	Unknown	-------	thin wavy cordon, grass marked

Fig. 195.

Foshigarry: Cluster 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
366	19	Unknown	broken off	slanting nicks below rim and two leaf shapes infilled by strokes
371	21	Unknown	everted	parts of two rows of dots which formed part of a chevron
386	94	Unknown	-------	complex of angled incised lines
376	77	Unknown	-------	cordon with transverse nicks and incised lines from chevrons
380	78	Unknown	-------	thin cordon, infilled chevrons above

Fig. 196.

Foshigarry: Cluster 5

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
369	20	Unknown	-------	two rows of incised lines with dots inbetween, forming chevron
382	56	Unknown	-------	very thin cordon, above incised form a chevron infilled with herringbone
385	79	Unknown	-------	worn wavy cordon, herringbone above

Fig. 197.

Foshigarry: Cluster 6

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
368	13	Unknown	everted	finger tip impressions below rim incised lines form chevrons with also 'triskele' pattern, wavy cordon below
379	82	Unknown	-------	worn cordon with slanting nicks, incised chevrons above

Fig. 198.

Foshigarry: Cluster 7

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
370	14	Unknown	everted	finger tip impressions below rim incised lines and lattice
388	15	Unknown	broken off	finger tip impressions below rim
375	29	Unknown	everted	cordon impressed with a small object, chevron above
381	54	Unknown	-------	applied boss with large dimple
383	32	Unknown	thin and everted	incised lines form a lattice below the rim

Fig. 199.

Foshigarry: Outlier 378

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
378	26	Unknown	broken off	large lattice effect

Fig. 200.

Foshigarry: Cluster 8

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
373	28	Unknown	broken off	zigzag herringbone pattern
374	88	Unknown	-------	very thin plain cordon with 'fir trees' incised above

Fig. 201.

styles and decorative traits are represented. Providing a date for the main period of occupation would be speculative; there is no reason to assume that the recovery of the bone dice and composite combs represents anything more than later occupation of the site. This is an occurrence which can be documented at other wheelhouse sites, for example, A Cheardach Mhor, S. Uist phase 5 (Young and Richardson 1960, 158) and at the ruined broch of Dun Mor Vaul, Tiree (MacKie 1974, 90-91). It is clear from the complexity of the structural remains, however, that the occupation was multi-phase and so the pottery may be also.

NAA results.

Twenty-seven NAA samples were taken from Foshigarry sherds and the cluster results are shown in Fig. 186. It is unfortunate that no contexts were known for the analysed sherds because this makes the identification of archaeological patterns much more difficult. Figs. 187-192 demonstrate the existence of 8 clusters and their characteristics are contained in Figs. 193-201. The criticism applied to Balevullin, namely that the value of NAA on sherds for which contexts are not clear is reduced, also pertains in this case and no correlation between chemical groupings and decorative types may be made.

The site of Clettraval.

The site lay on a terrace on the southern slopes of Clettraval hill and was constructed on the tail of what had been a wedge shaped burial cairn. It was excavated by Sir Lindsay Scott during the years 1946-48 (Scott 1948), during which the site was revealed to have been an 'aisled round house', a structural type which he believed encompassed wheelhouses, brochs, wags and hut circles. Its closest similarities, however, are to the wheelhouses more usually discovered on the coastal machair of North and South Uist, although not uniquely so as the site of Tigh Talamhanta, Barra demonstrates (Young 1953). The site of Clettraval consisted of a main round house (Fig. 202), a complex of buildings including byres, working platforms and a partially surviving farmyard wall. Whether all these structures are coeval is a matter for debate. The main farm house, which contained the vast bulk of the recovered pottery, was deduced by the excavator to have undergone four phases of. occupation and reconstruction. In the first and major stage the main house was built and occupied, this was followed in phase 2 by a lessening of the span of the roof and a reorganization of the house interior. Following a further roof collapse into the central area the site was reoccupied in phase 3 with the creation of a smaller hut in the western end of the original house but still utilising the original entrance passage. In the final stage of occupation the entrance passage was itself filled in and a small hut built over both it and the adjoining wall. This seems to have marked the last major activity on the site, although the

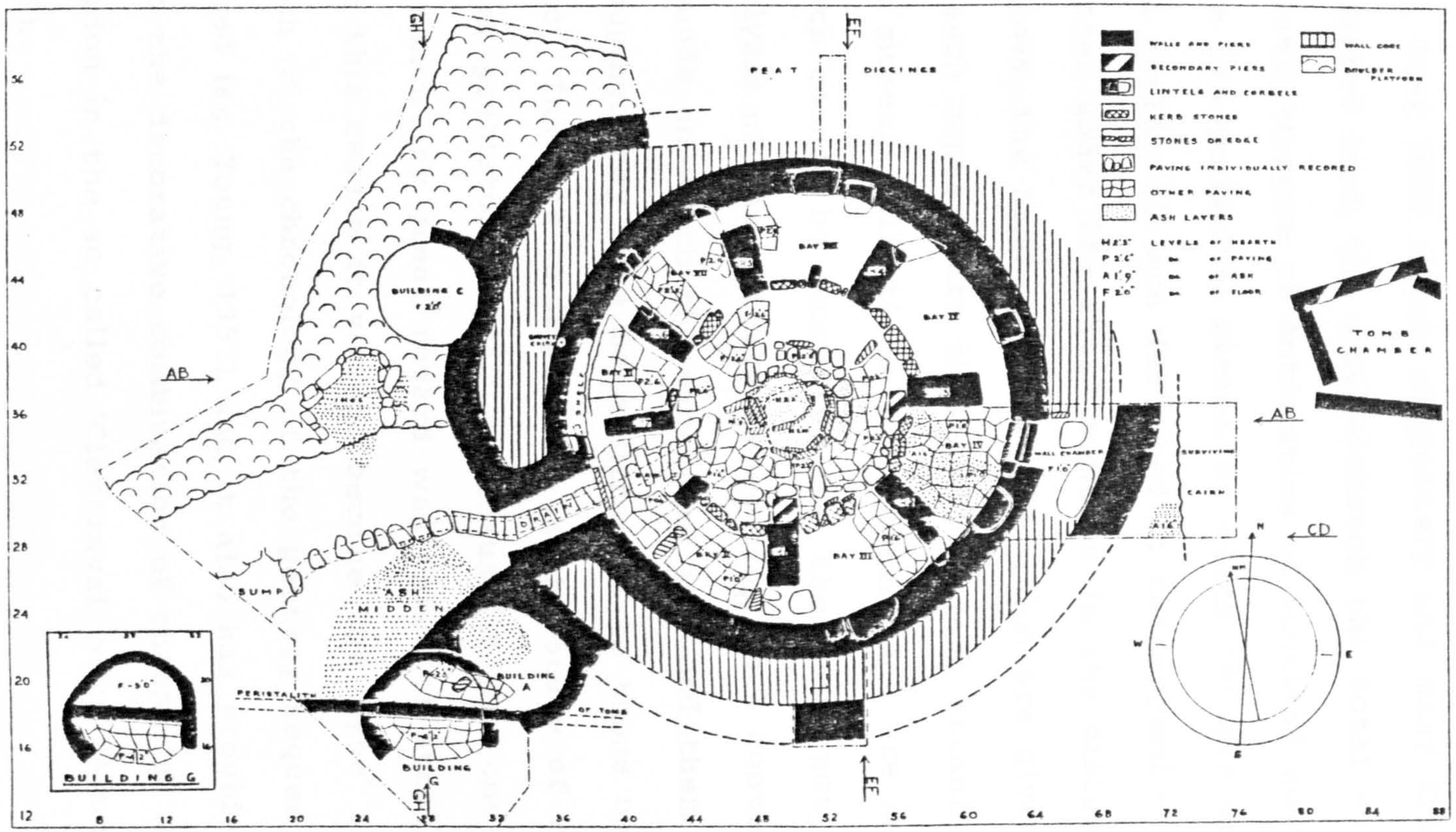


Fig. 202: Clettraval site plan (after Scott 1948).

ruins were used as temporary shelter for lambing and other farming activities.

The Pottery from Clettraval.

Over 3000 sherds of pottery and many fragments were recovered from the site, although the total now in the National Museum of Antiquities of Scotland now numbers a mere 583 individual pieces, of which 166 are undiagnostic wall sherds. All are described in the appendix to the chapter under 289 sherd numbers. In the discussion which follows, the numbers of sherds which are given as belonging to each context are those which were extant and examined in the museum collections. It is clear that are many sherds which cannot be accounted for; these are not included in the analysis of the pottery types from each context, as the grounds on which the excavator included them within groupings may have been different to those used in this study. The site is important in the study of Western Isles later prehistoric ceramics because it was one of the first in which any great regard was taken of stratigraphy. In part for this reason it was to become the 'type' site upon which much of the chronology of the pottery sequence has been based (eg. Young, 1953) and it also has provided the name for the decorative combination of channelled arches and wavy cordon in the so called 'Clettraval ware' (MacKie 1974, 159).

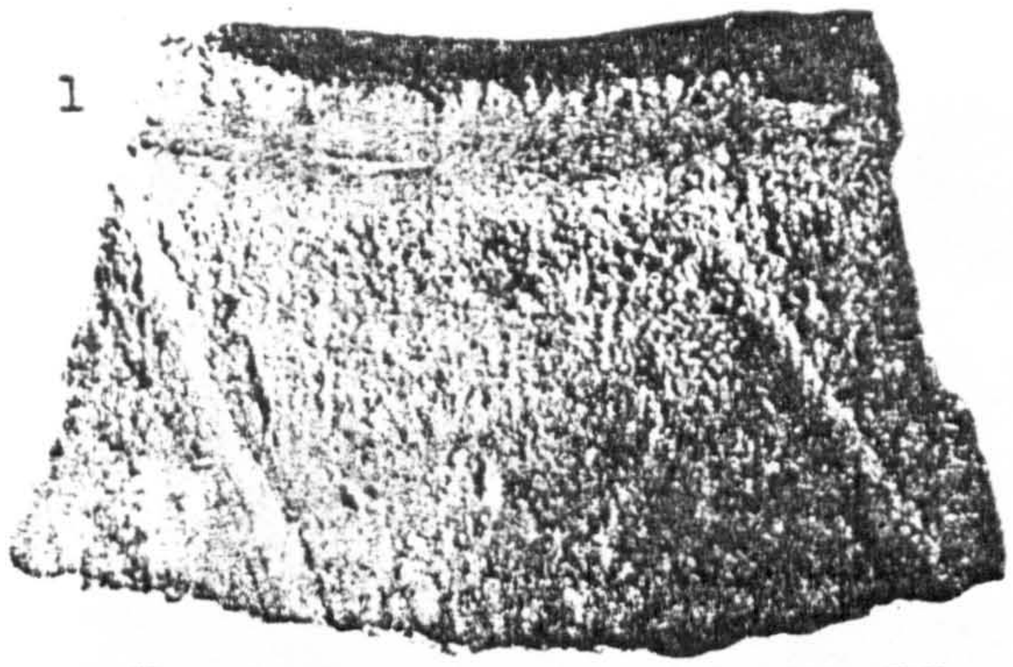
The majority of the pottery sherds from the site have both an area and a layer context, although one of the difficulties with the latter is that all the measurements were taken from one survey point and that because the site was on sloping ground layers which may have occupied the same chronological time span can have quite different level numbers. This is in part solved in appendices I and II of the report (Scott 1948, 116-120), in which the excavator sorted the level numbers to give three broad chronological categories, lower, middle and upper. A number of area contexts can also be noted; the south western quadrant of the round house, including bays 1 (the inner entrance) and 2, individual bays 3-4 and 6-9 (there was no bay labelled as bay 5), the south eastern quadrant of the central area, the northern half of the central area, the external entrance area, the outside working platform known as building 'C' and finally as a major context, the sections through the round house walls.

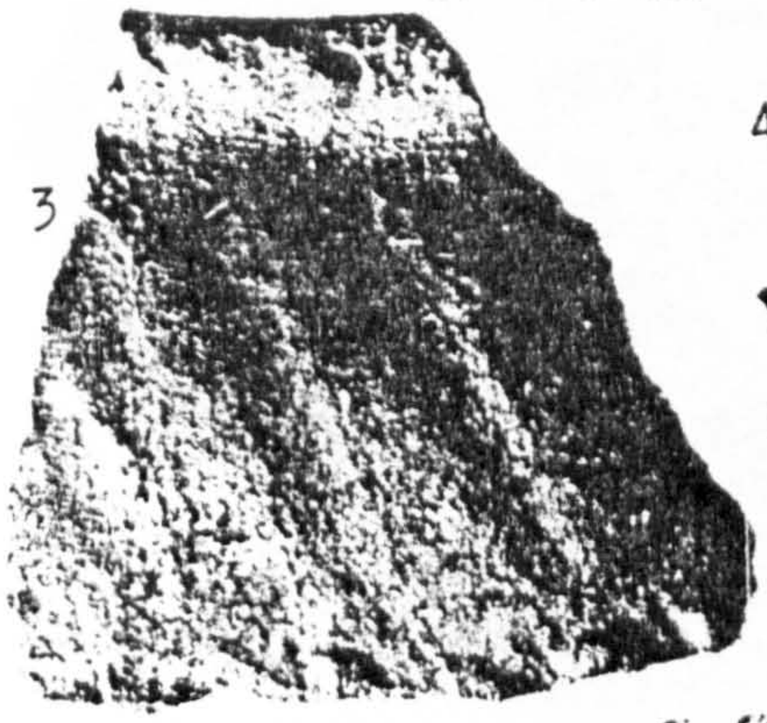
<u>The Lower Levels of the S.W. Quadrant and Individual</u> Bays.

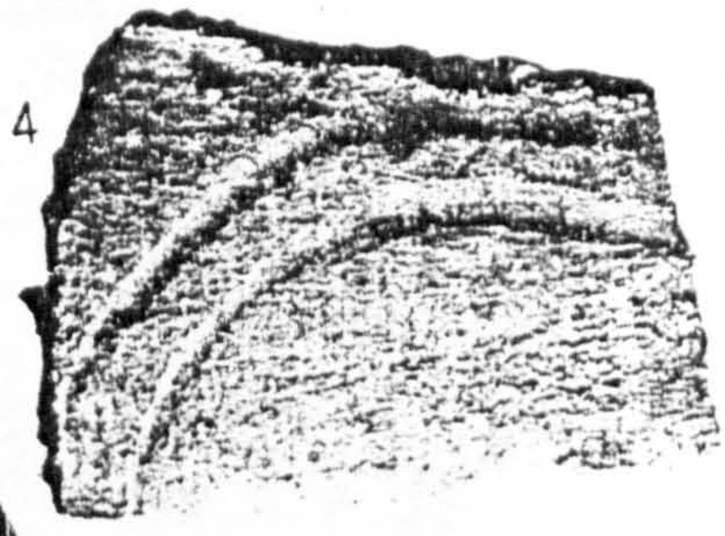
The numbering for the individual bays within the round house did not follow a logical sequence, either clockwise or anticlockwise, nevertheless sherds in the main can be assigned to relatively specific locations. The whole of the south western quadrant of the house, including bays 1-2 and the central area were one such location and in the lower

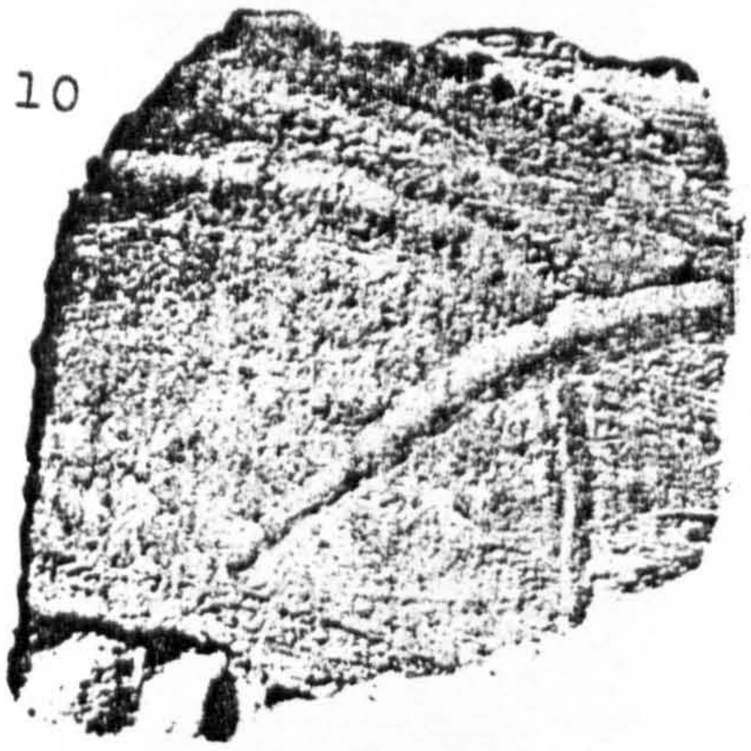
levels yielded a total of 7 sherds. Of the sherds 2 were from everted rim vessels (nos. 1 and 106) and 1 from a plain rimmed pot, in the case of no. 1 (Fig. 203) the rim was sharply turned over and folded on the inside and in addition bore a broad channelled groove decoration of chevrons just below. Sherd no. 126 was the base from a small open bowl, whilst the remainder (nos. 22, 135 and 144) all bore applied wavy cordons.

Bay 3 contained more pottery sherds in the lower levels than any other, a total of 50 were examined in the museum collections. Of the rim sherds again the majority were everted (eg. nos. 2, 13, 91-92 and 94-95) or survived as the flanges broken off from everted rim vessels (nos. 226-228 and 236-237). A further 2 sherds had plain, rounded rims (nos. 256 and 266) and 1 sherd displayed an unusual rolled and beaded rim (no. 97). The characteristic decoration was the applied wavy cordon which occurred on 25 sherds (eg. nos. 27-28, 147-148 and 180-182) and in one of the cases in the neck angle of an everted rim (no. 247). It should be noted that sherd no. 30 (Fig. 204), which is one of the cordoned sherds, derived from bay 3 and not the central area as indicated in the report (Scott 1948, pl. XI no. 12). The other cordon type to be represented was the straight variety which had been slashed by vertical nicks to give a 'billeted' effect (nos. 49-50). A single sherd bore incised decoration of very faintly scored parallel horizontal lines (no. 75) and one other had a broad slanting channelled









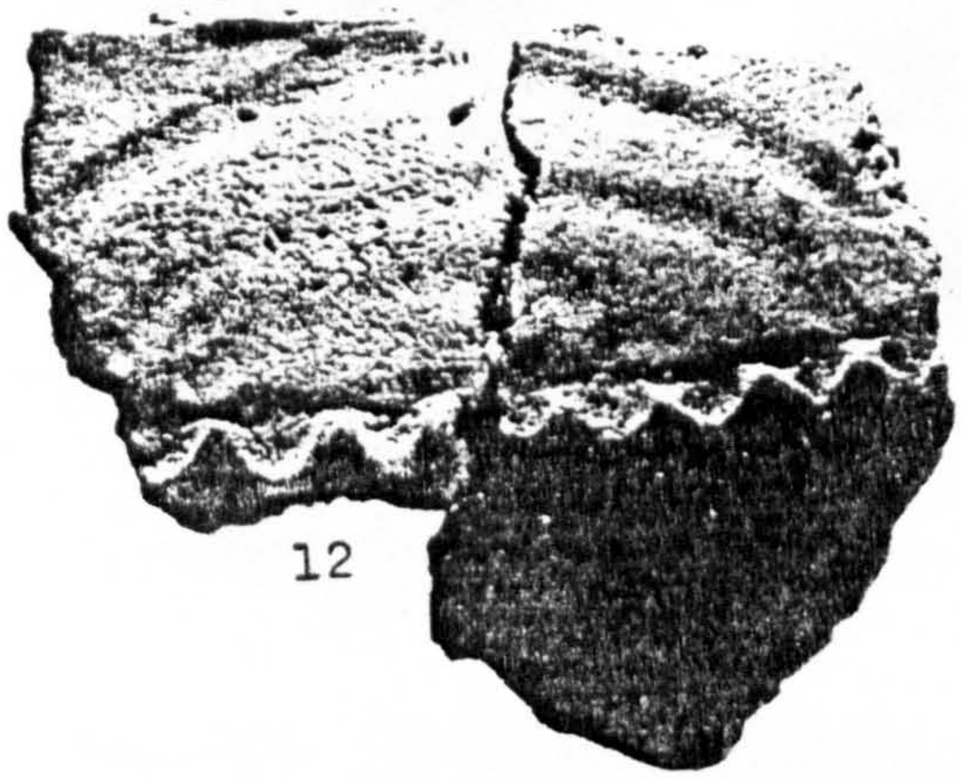
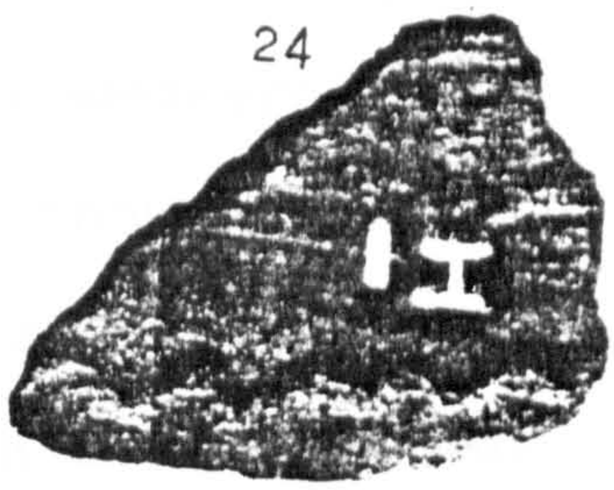
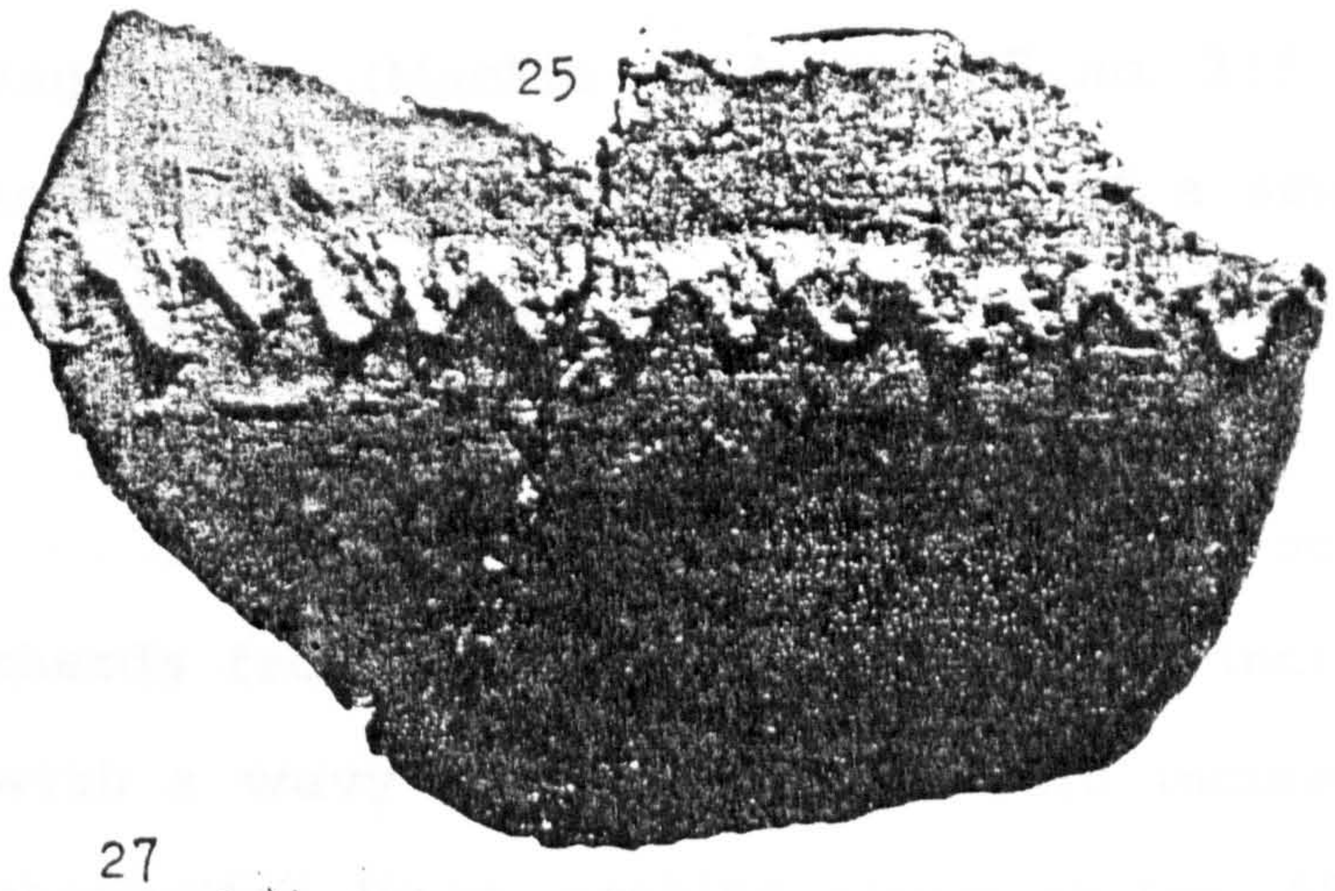
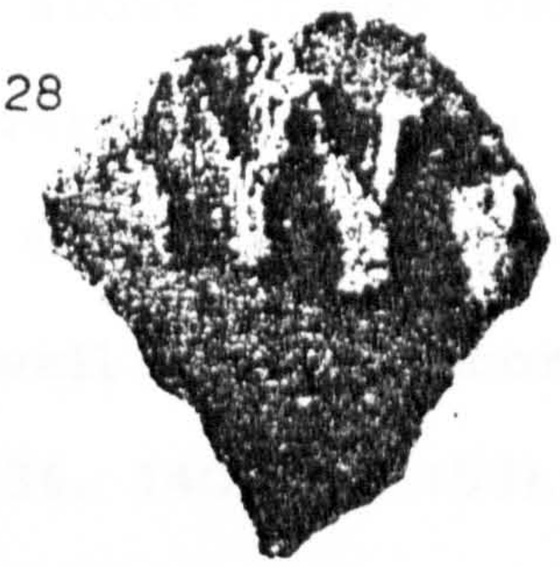
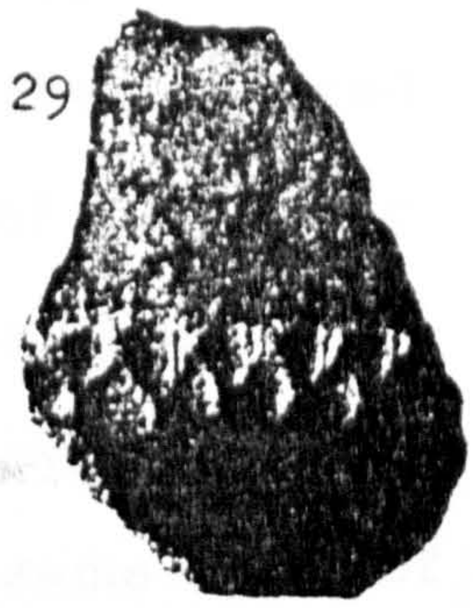


Fig. 203: Clettraval pottery. Scale 1:1.1 (after Scott 1948).









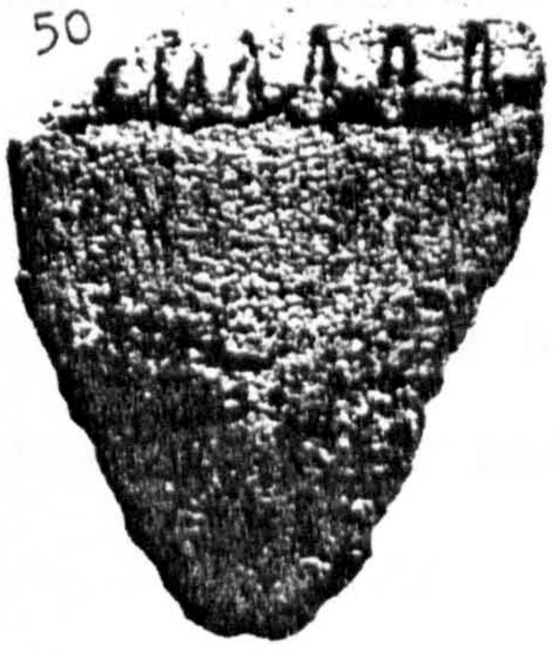


Fig. 204: Clettraval pottery. Scale 1:1.1 (after Scott 1948).

groove beneath an everted rim (no. 2) and was of a nature not dissimilar to sherd no. 1 from the south western round house quadrant. Sherd no. 224 (Fig. 207) was though by the excavator to have been the bowl of a clay spoon and while parallels for such an artefact do exist, such as at Dun Mor Vaul, Tiree (MacKie 1974, fig. 17 no. 319), it is at least equally possible that it is part of a small metal working crucible of a type not uncommon in the Hebrides.

The finds from bay 4 were much scarcer, totalling 8 sherds from the lower levels. These included 1 everted rim with a wavy cordon and two thin incised, as opposed to channelled lines, arching above it (no. 68). Another everted rim sherd was also recovered and had a row of finger tip dimples in the neck (no. 86). Apart from a base sherd (no. 279) the rest were all wall sherds decorated with applied wavy cordons (nos. 38, 136, 140 and 153). The same level of bay 6 contained in addition to wavy cordons (no. 161) a number of the sherds which displayed channelled overlapping arches (no. 10) and incised lines (nos. 42 and 44). Finger tip channelling was visible on no. 5 and on no. 3 which displayed an everted rim. Everted rims, or detached rim flanges were evident on nos. 90, 103, 134 and 229, with no. 246 being out turned and no. 114 flattened. Sherd no. 223 was of interest in being a rolled piece of clay which was interpreted by the excavator as a spoon handle, this may be the case but the evidence for such an exact function is not satisfactory.

The 10 sherds from the lowest levels of bay 7 included an everted rim with an applied wavy cordon in the neck (no. 20), a plain rim (no. 269), 2 base sherds (nos. 129 and 286) and 5 other sherds which bore cordons. Of these, 4 had wavy cordons (nos. 34, 36, 150 and 159) and 1 worn, but probably originally straight, with crescent impressions along it (no. 53). One very coarse sherd from these levels bore a deeply incised nested chevron pattern, it was from a vessel of which no other sherds appear to have been found on the site. A single incised sherd was also recovered from the lower levels of bay 8, it was decorated with double parallel sets of lines meeting each other obliquely (no. 72). The other sherds from this context included a sharply everted rim with a wavy cordon (no. 14), an everted rim flange (no. 102), a sherd with channelled arches (no. 4), a sherd with a wavy cordon (no. 177) and one with a very fine straight cordon with a rosette pattern impressed upon it (no. 54). The last of the bays, number 9, also contained a sherd with broad channelled lines (no. 8), as well as an everted rim flange (no. 238), a sherd with a wavy cordon (no. 158), a base (no. 122) and a single sherd bearing an incised leaf pattern (no. 59).

<u>The Remaining Lower Level Contexts.</u>

The only other contexts from the lower levels to yield pottery and which are extant in the National Museum, were

the northern quadrant of the round house central area and the entrance. A single sherd in the collections can be ascribed to the former context, it bore a heavy applied wavy cordon (no. 45). The exterior of the round house, in the entrance area, produced a further 2 wavy cordons (nos. 141 and 154) and also an incised sherd displaying a pattern of six nested chevrons (no. 80). It also contained the only sherd from the site to have a decoration of applied bosses (no. 88, Fig. 206) and in addition had a slightly everted rim. Sherds with like decoration have been recorded from Tigh Talamhanta, Barra (Young 1953, fig. 8 nos. 75-76) and from A Cheardach Mhor, South Uist (Young and Richardson 1960, fig. 5 no. 18).

Pottery from Middle Level Contexts.

The pottery from these levels will be discussed under the same area headings as the pottery from the lower levels above. A total of 6 sherds could be ascribed to the south western quadrant of the round house, including bays 1 and 2. Two rim types were represented, one was thick and out turned (no. 98) and the other was very fine and rolled over (no. 101). Decoration was present on the other sherds, of which 3 bore wavy applied cordons (nos. 24, 146 and 166) and the fourth had two incised parallel lines (no. 61). These presumably formed part of a pattern, now unclear. Bay 3 contained 11 sherds of which the 3 rim sherds were everted (nos. 16-17 and 107) and of which nos. 16 and 17 had a

decoration of an applied wavy cordon pressed into the neck of the vessel. Of the remainder 3 also bore wavy cordons (nos. 33, 175 and 178), another had a cordon with scratch marks (no. 43) and a fifth had a thin wavy cordon with triple incised parallel lines running off it vertically (no. 67. One sherd had a straight cordon which had been finger tip impressed to give a 'billeted' effect (no. 51), one had 3 parallel incised lines (no. 187) and the last sherd had two faint channelled lines meeting each other at an angle (no. 9).

Only one sherd could be ascribed to the middle levels of bay 4; it was a base of undiagnostic type (no. 280). Bay 6 contained 4 sherds in which an everted rim could be identified (no. 121) and another hinted at although the rim was missing (no. 15). This latter sherd also bore an applied wavy cordon. The 2 remaining sherds were both small and had incised decoration consisting in one case of four parallel lines running off a fifth at an oblique angle, perhaps it may originally have formed part of a hatched pattern (no. 76). The other sherd (no. 74) had three parallel incised lines. The two sherds from the middle levels of bay 7 (nos. 139 and 142) both had applied wavy cordons, as did each of the single sherds from bays 8 (no. 36) and 9 (no. 160). A greater quantity of sherds were labelled as being from the northern half of the round house central area, 14 in total. Of these 8 were rim sherds, 3 plain and rounded (nos. 257, 261 and 263), 1 flattened (no. 250) and 1 out turning with a

line of finger tip dimples in the neck (no. 87). Others included a slightly out turning rim with two parallel incised lines infilled with impressed dots to give a semi 'ladder' effect (no. 60), one everted rim flange (no. 232) and one sharply everted rim with the remains of four parallel incised lines running obliquely down from it. Of the wall sherds 4 had applied wavy cordons (nos. 40, 149, 173 and 183), and 1 had a cordon which was finger tip impressed in a chain effect with part of an applied straight strip of clay underneath (no. 55). The remaining sherd had an incised pattern with the whole of the exterior surface being covered in a close set fine herringbone pattern (no. 62); no other sherd like it was recovered from the site (Fig. 205).

Of the sherds form the south eastern quadrant of the central area, three bases were recovered (nos. 125, 130 and 289), two plain rounded rims (nos. 260 and 264), two everted rims or everted rim flanges (nos. 232 and 252) and one everted rim with an applied wavy cordon pressed into the neck angle (no. 18). Of the decorated sherds, two had applied wavy cordons (nos. 138 and 143) and one small sherd had a single broad channelled groove (no. 77).

The Middle Levels of the Exterior Areas.

Only one sherd which was labelled as coming from the middle levels of the site was recovered from the areas

Fig. 205: Clettraval pottery. Scale 1:1.1 (after Scott 1948).

outwith the round house itself. The piece of pottery was recovered from the area just outside the entrance and it bore a single incised line (no. 189). The fact that so few sherds from contexts outside the round house can be related to the varying levels is largely due a lack of precision in the recording of the find locations such that sherds from structure 'C', for example, are mainly ascribed to that building and not to any specific layer.

Pottery from the Upper Levels.

The National Museum collections contained no sherds which could ascribed to the upper levels of the south western quadrant of the round house, inclusive of bays 1 and 2 or from the individual context of bay 3. Bay 4 contained one plain rim (no. 262), one everted rim (no. 255) and one sherd which had two parallel incised lines (no. 71). The only other bays to produce pottery were number 7 with a sherd with a flattened rim (no. 115) and bay 8 which again had a single sherd, in this instance with an applied wavy cordon. The only other context to produce upper level pottery within the round house was the northern half of the central area. Of the eight sherds which could be identified from this context, there were three flattened rims (nos. 111 and 116-117) of which no. 117 also had a channelled groove, two everted rim flanges (nos. 235 and 242) and one plain rounded rim (no. 259). A further rim sherd was slightly out turned and had a decoration of finger tip impressions in the

rim angle with the remains of a large incised chevron beneath (no. 64).

The Sections Though the Walls.

During the excavation two sections were cut through the round house wall, one to the north of the entrance and the other to the east of bay 4; this latter context produced no pottery. Six sherds, however, are from the former section, to the north of the entrance. These included an everted rim (no. 253), an everted rim flange (no. 239) and a plain rim sherd (no. 270). Sherd no. 285 was a base and the remaining two sherds were decorated, one with short incised lines and dots (no. 70) and the other with incised chevrons (no. 82). It is not known to which level in the round house interior these sherds relate.

The Round House External Entrance and Midden Area.

Two of the sherds from this context (nos. 80 and 88) are known to have come from the lower levels and hence have been discussed above. Of the sherds not previously discussed, all the rim sherds are either everted or are everted rim flanges (nos. 63, 96, 108, 243, 248 and 251). Of these only two are decorated, no. 96 which has an internal rim bevel and no. 63 which has incised lines forming cross hatching below the everted lip. A portion of a cross hatched pattern is also visible on sherd no. 79. The other three

decorated sherds all have applied wavy cordons (nos. 37, 41 and 174). The hearth outside the round house entrance contained one base sherd (no. 278). The context known as the entrance midden was located to to the south of the drain and contained pieces of three vessels. No. 284 was part of a base, no. 265 was a plain rounded rim and no. 170 had an applied wavy cordon.

Evidence of metal working on the site was provided by the recovery of sherd no. 225 which was the lip of a small crucible. The grey clay of the vessel had been covered by a reddish vitreous deposit that proved to be a residue of copper and tin, indicative of bronze melting. The belief that the crucible was of triangular type, similar to those from other parts of the Western Isles and indeed to those from Glastonbury (Scott 1948, 68), cannot be assumed proven from comparison of the fabrics alone, and too little of the profile of the vessel survives to confirm the crucible type.

Building 'C' the Working Platform and Shelter.

The levelled platform with associated shelter was considered to have been one of the structural features of the primary phase of the site's occupation. What is less clear, however, is if all the pottery derived from it can necessarily been seen as early too. One of the worrying aspects of the case is that although the excavator believed there was stratigraphical evidence for the building's early

period of usage, this belief was confirmed for him by the nature of the pottery recovered (Scott 1948, 55). Such a conclusion, based on the pottery alone is not the ideal situation and while one might have to accept his interpretation of the stratigraphy, given that he was the excavator, there is no overwhelming reason why the pottery should all be considered early, especially when there was known disturbances of the site.

Eighteen pieces of pottery can be identified as deriving from the hut 'C' location. A wide variety of rim types is represented including the usual everted type (nos. 89 and 254) and also a flattened upright rim (no. 109), an incurving rim (no. 93), two beaded and rounded rims (nos. 99-100) and two everted rims with internal bevels (nos. 110 and 233). Another of the everted rims had an applied wavy cordon pushed into the neck (no. 19). Wavy cordon also occurred on sherds nos. 137 and 155 as the sole form of decoration. Several pieces of the later named 'Clettraval ware' were also present, with sherds nos. 11-12 displaying the characteristic triple finger channelled arches above a wavy cordon. Sherd no. 7 also had the channelling but the cordon was absent, probably having broken off. In addition to the cordoned vessels, two others demonstrated the existence of incised ornament. No. 65 had a line of dimples and a leaf pattern below the broken off rim. No. 73 had double inter crossing parallel lines, which perhaps originally formed the tops of chevrons. Thus quite a wide

range of vessel types can be seen to have been present in this context.

Pottery from Unknown Levels.

A number of the sherds from the site are from either defined area contexts but of no known level, or are from no known context whatsoever. From the south western quadrant of the round house, including bays 1 and 2 but of uncertain level are a sherd with a cordon modelled into billets (no. 52), a thick rounded rim (no. 105), a sherd with a single incised line (no. 188) and three base sherds (nos. 124 and 287-288). From bay 4 there is a cordon moulded into a chain pattern (no. 47), from bay 7 and from the south eastern quadrant of the central area there are everted rim sherds (no. 104 and 240) and from bay 8 there is a sherd with an applied wavy cordon (no. 162). The sherds of no known context comprise seven with applied wavy cordons (nos. 23, 26, 39, 48 and 184-186) and one everted rim flange (no. 234).

Pottery from Surface Levels.

In the excavation of this and virtually all the other Hebridean later prehistoric sites the presence of much later occupation and disturbance has been easy to demonstrate (eg. Scott 1948, 57; Young 1953, 88; Fairhurst, 1971, 74). One consequence of this has been that pottery from the surface

levels of the sites has usually been treated as being unstratified, with excavators sometimes attempting to ascribe sherds to assemblages in the lower levels with which they think the disturbed pottery has the greatest affinities. At A Cheardach Mhor, South Uist, for example, a sherd with an applied boss recovered from the disturbed levels of phase 5 is grouped with the vessels from phase 1 (Young and Richardson 1960, 144 and 158). Such a subjective process is inherently dangerous and serves only to impose structure where none might exist.

At Clettraval the pottery which was once known to exist, and which came from the surface context, provided over half of the total number of sherds from the upper levels of the site and within that grouping provided more than two thirds of the decorated sherds (Scott 1948, Table 1). Given the problems which are known to exist with regard to stratigraphy, the inclusion of the pottery in the 'statistical analysis' of the assemblage from the site (Scott 1948, Table 1) perhaps gives a spurious impression of authority. Hence while the pottery will be described, its use in any attempted definition of sequences or chronology will be limited.

Within the collections in the National Museum a total of twenty-five sherds can be demonstrated to have derived from surface levels, of which ten came from the entrance area. The pieces of pottery within the round house interior

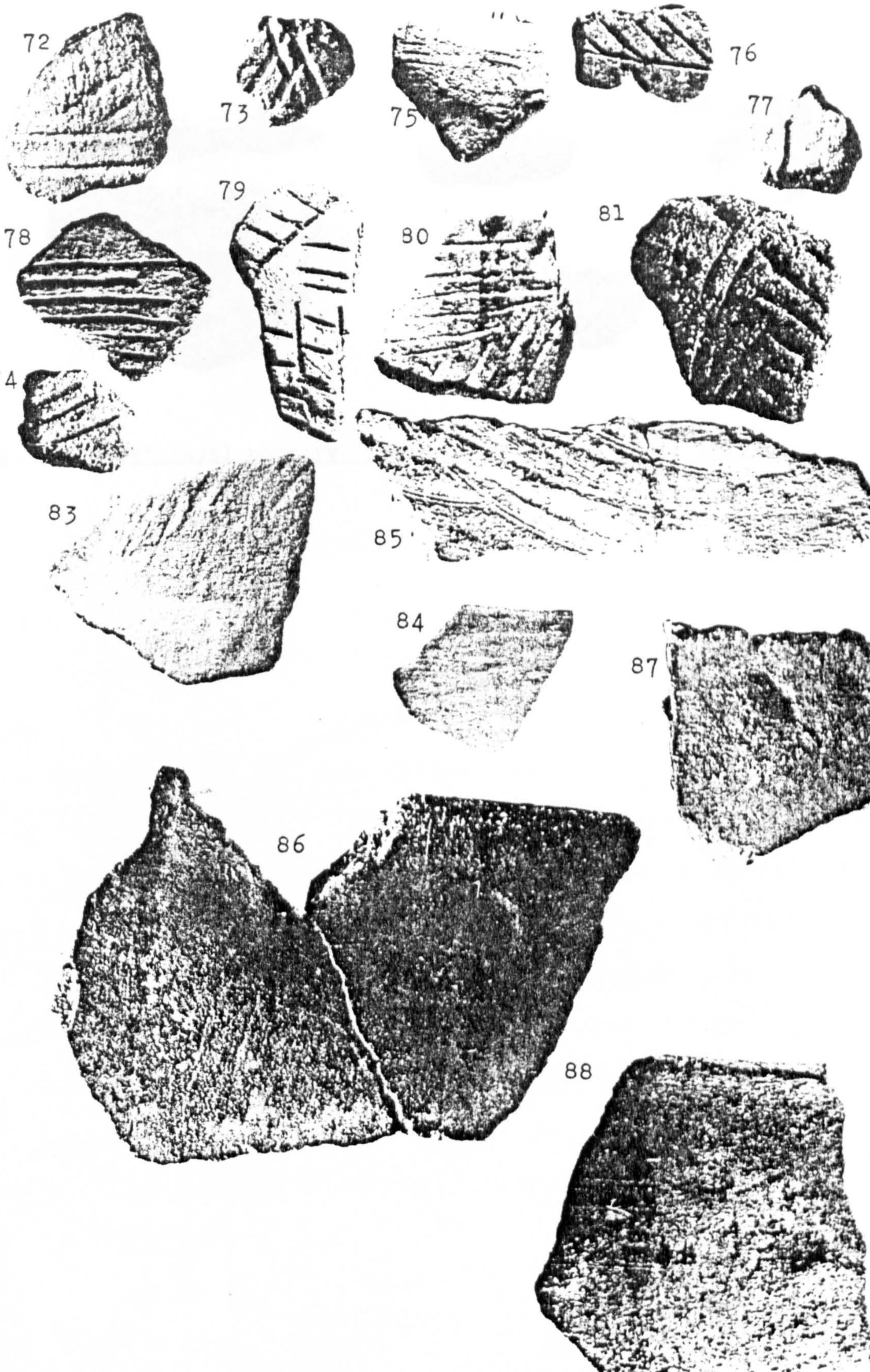


Fig. 206: Clettraval pottery. Scale 1:1.1 (after Scott 1948).

Fig. 207: Clettraval pottery. Scale 1:1.1 (after Scott 1948).

included two flattened rims (nos. 112-113), two flaring rims (nos. 118-119), one everted rim flange (no. 230), one out turned rim (no. 249) two plain or undiagnostic rims (nos. 258 and 268) and one basal angle (no. 277). Amongst the decorated pottery were a sherd with arching channelled curves (no. 6) and a sherd with an applied wavy cordon and three straight incised lines above (no. 66). Another sherd has a wavy cordon and a curved strip of clay applied above or below (no. 57) and one sherd possessed a cordon which was impressed with a chain pattern (no. 46). The pottery thus displays a variety of the more common features of the Clettraval site.

The pottery from the surface levels of the entrance area contained only one rim sherd, the flange of an everted rim (no. 231), although also represented were three parts of bases (nos. 123 and 282-283). The decorated pieces, however, displayed the same diversity of motifs visible in the sherds which derived from the surface levels in the round house interior. Three sherds had applied wavy cordons (nos. 29, 41 and 152), one sherd had parts of six parallel incised lines (no. 78), another had a wavy cordon with two thin incised lines above (no. 69) and one unusual flat sherd had grooves on both sides with a small knob of clay adhering to the exterior (no. 131).

Chronology.

The only vaguely datable artefact recovered during the excavations was half of a globular bead of translucent, pale green glass which was found below the level of the floor in bay 9. The excavator, perhaps to support his chronology for the pottery sequence, suggested that it could have worked its way down to this context from higher levels (Scott 1948, 66), and although this has become accepted (Guido 1978, 70), there is no reason to assume that this is necessarily the case. It is a bead of the class 7 (possibly ii, or more likely iii) variety which is uncommon in Scotland with only two other examples known, from the Culbin Sands, Morayshire (Guido 1978, 169). The contexts within which beads of the type are recovered in Southern Britain indicates a Roman or early post Roman date, perhaps of the later rather than earlier Roman period. Such a date is not greatly at variance with others suggested for this type of later prehistoric structure in the rest of the Western Isles, although it is perhaps a little later than that indicated by the commonly found yellow beads of class 8.

Sir Lindsay Scott also attempted to date the site from the pottery sequence, mainly using South Western British and Northern French parallels in style and decoration. It is clear that these parallels and influences are not universally accepted in the study of the Hebrides in this period (Alcock, 1984) and while there are similarities it remains to be proven that one derived from the other and that the coincidence is not merely the result of common

potting techniques, requirements of function, or a consequence of being part of a greater North West European cultural milieu.

The Pottery Sequence.

Clettraval has had an important role in providing part of the sequence for Hebridean pottery and not just for having been the type site for a particular ware. The evolution of styles and decoration which Sir Lindsay Scott outlined were followed, usually explicitly, in many of the site reports of the 1950's and later (eg. Young 1953, 95; Fairhurst 1971, 92). For a large part the authority which his views carried were based upon the analysis of the pottery that was outlined in the appendix to the report. He described it as a 'statistical' analysis, perhaps numerical analysis would now be a better term (Scott 1948, Table 1). From this table he derived five conclusions regarding the pottery sequence (Scott 1948, 120), these will now be examined in turn. It should perhaps be pointed out that before conclusions can really be based on sheer numbers of sherds, a necessary control factor must be assumed; namely that all vessel and decorative types must be likely to undergo the same processes of discarding and deposition throughout all periods of the sites occupation. This is clearly a debateable point.

A further consideration is the accuracy of the numbers

within each column of the table. Only 583 sherds are to be found in the collections of the National Museum, yet the total from the site was once over 3000, so if inaccuracies are to be found in Scott's table then they are only to be proven if they are errors of omission. This is the case for several contexts. In the lower levels of bay 4 the table indicates that there is only one sherd with incised or channelled decoration; in fact there are two (nos. 68 and 85, PL. IX.12 and PL. X.7 respectively) and both are illustrated in the site report! Also to be added to the table are several sherds from the middle levels, for example, in bay 6 there is one sherd with an applied wavy neck cordon (no. 15) and in bay 7 there are two sherds with wavy cordons (nos. 139 and 142). From the upper levels of bay 4 there are no recorded sherds with incised decoration, yet there is in fact at least one, no. 71, which again is illustrated in the site report (PL. IX.9). These are just a few of the errors which can be proven, there may be others which owing to the small number of the surviving sherds now cannot. Although these inaccuracies may be noted, it is perhaps also instructive to examine the statistical validity of the statements which were made about the pottery sequence from the uncorrected table.

It will be remembered that the lower levels represent stages 1 and 2 of the site's occupation, the middle levels represent part of stages 1 and 2 but may be mixed with higher phases and the upper levels contain the pottery of

stages 3 and 4 habitation. Clearly one of the major limiting factors in examining the pottery from the four different phases, is the recording system which logged sherds and contexts from a fixed datum and not by the levels as they were excavated. This makes the provision of evidence for arguments about changes between phases much more difficult.

The first assertion was that relief decoration, such as the wavy cordon, was initially a subordinate technique but that after stage 2 it became the only form of decoration. The first factor to bear in mind is that while the numbers Scott quotes refer to individual vessels, in very many cases these vessels are represented only by single sherds, therefore the population base from which the assertions are made is in reality quite small and not capable of supporting sweeping conclusions. Assertion one was largely derived from the figures for the four northern bays as these were the least disturbed, this may be the case but it ignores the fact that the other bays may have been areas of different functional usage with pottery to match and so unless the whole of the contemporary stage 1 assemblage is considered the evidence from just one part of the site cannot be convincing. If the entire lower levels, ie. stages 1 and 2, are considered then relief decoration comprises 73% of the total and other classes of decoration 27%. In the middle levels, however, the respective types comprise 62% and 38% of the total; can relief decoration therefore be said to be becoming predominant?

Assertion two was that incised decoration was used throughout stages 1 and 2 but that it probably did not survive beyond stage 2. In the lower levels incised decoration comprised 10% of the 81 vessels represented, in the middle levels 32% of the 37 vessels and in the upper levels 5% of the 22 vessels, if however, the extra incised sherd from the upper levels of bay 4 is included the figure for that context would be 9% of 23 vessels. The proportional values for incised decoration in the lower and upper levels can thus be seen to be nearly the same and if one was to labour the point and imagine that another incised vessel, ie. just one other incised sherd, were to have come from this context the value would be almost 13% of 24 pots. This both again highlights the problem of the sample size and negates the assertion that incision died out after stage 2; if one wanted to adopt the logic behind the table it could be argued that incision was almost as flourishing at the end of the site's usage as it was at the beginning!

Assertion three was that the technique of grooving, most commonly seen in curvilinear patterns, belonged to the first stage of occupation and died out before the end of that phase. Of the sherds with this type of decoration in the table, 9 came from the lower levels, 1 from the middle levels, 3 from building 'C' and 1 from the upper levels. This assertion is to a large part dependent upon the acceptance that the working platform, building 'C', was

contemporary with the earliest occupation of the house and not with the middle or upper levels. That it was early seems to have been accepted by Scott not on the basis of stratigraphy but on the recovery of the types of pottery, including parts of 6 decorated vessels, from its floor (Scott 1948, 55), a case of circular argument if there ever was one. Suffice to say that if one chose to date the building to the upper levels the proportion of grooved vessels in that context would be 14% of 28 vessels, or to the middle levels 9% of 43 vessels yet if the the pottery really is contemporary with the lower levels, the proportion is still also only 14% of 87 vessels. Thus the dating of hut 'C' is crucial if the third assertion is to stand, unfortunately there is too much doubt for this to be the case.

THe fourth of the conclusions was that the stamped technique and the lines of bosses were early forms which were unlikely to have continued into stage 2. In the lower levels these two decorative features were represented by 1 sherd of each type (nos. 88 and 54) out of a total of 81 decorated vessels. On the most simple of levels if one imagined that the distribution of the 81 pots represented a random sample of pot decorative types, then there would be a chance of 1 in 81 of each of the types being present in that sample, and perhaps, less since each is only a single sherd. If for the purposes of argument the samples from the middle and upper levels were also considered to be random samples

from the same population, then there would only be a 46% chance that say a sherd with a boss might have been found in the middle level and a 27% chance in the upper level. The crux of the matter is of course that there is no way of knowing what the contemporary pottery population was composed of, or what the processes affecting its deposition were, but unless there is satisfactory recording of all finds in every context, or until broad regularity in scheme can be seen from sites of the same nature, such assertions cannot be made.

The same criticisms can be made for assertion five for which the line of dimple decoration was one of the techniques picked out as continuing throughout the site's period of occupation; in each case the decoration is only visible on a single sherd. That such an examination of the sequence proposed by Sir Lindsay Scott is required is in some ways a credit to the work which he undertook, it is merely a pity others did not seek to continue his work by applying the sequences a little more critically in the light of their own excavations.

NAA results.

Fifty sherds from Clettraval were analysed by NAA and the resulting clusters are given in Fig. 208 with labelled contexts and levels in Fig. 209. Nine clusters were deemed to be significantly different from each other (Figs.

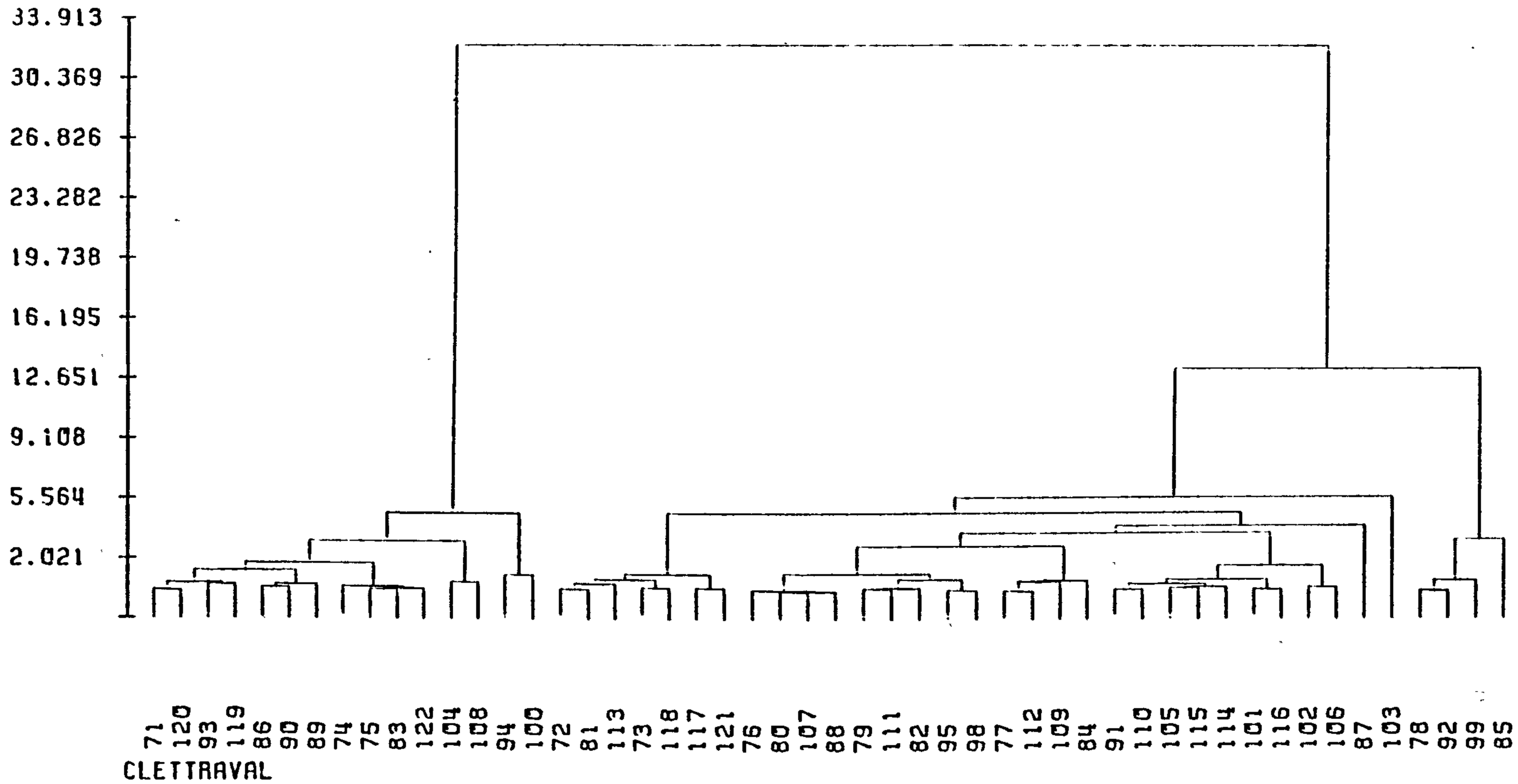


Fig. 208: Dendrogram of the sampled sherds.

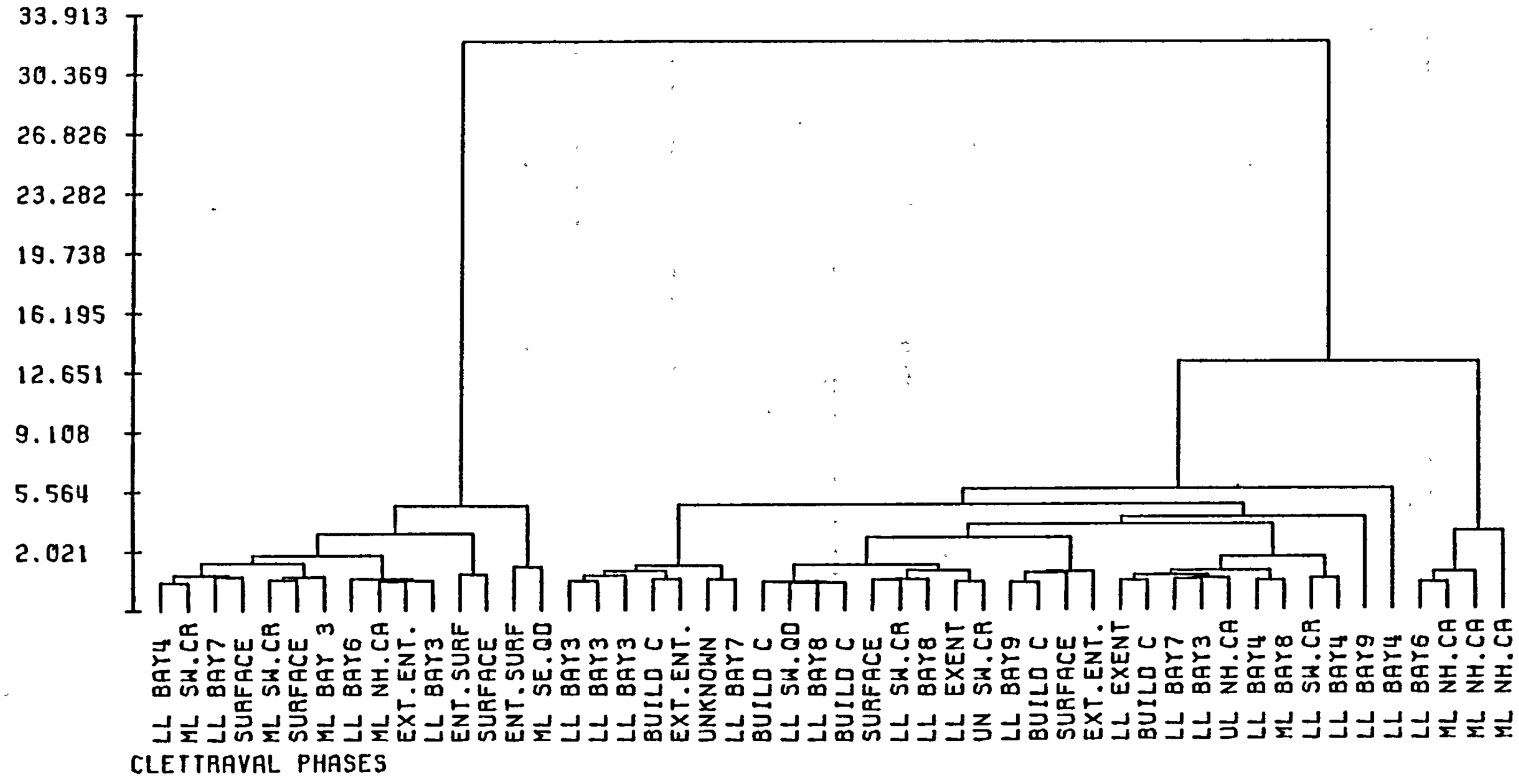


Fig. 209: Dendrogram of the sampled sherds, labelled by contexts.

Clettraval

Cluster Five, Cluster Six and unassigned group 77....84: NAA samples 76, 80, 107, 88, 78, 111, 82, 85, 98, 77, 112, 109 and 84. Cluster Seven: NAA samples 91, 110, 105, 115, 114, 101 and 116.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	0.2	1.4	0.2	27.6	99.8	7.80
Accept Null hypo.	No	No	No	Yes	Yes	Yes

Null hypothesis: Cluster Five, Cluster Six and unassigned group 77.....84 come from the same population as Cluster Seven.

Fig. 210.

Clettraval

Cluster Seven: NAA samples 91, 110, 105, 115, 114, 101 and 116. Cluster Eight: NAA samples 102 and 106.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	86.8	59.2	83.3	<0.0	10.2	7.5
Accept Null hypo.	Yes	Yes	Yes	No	Yes	Yes

Null hypothesis: Cluster Seven and Cluster Eight come from the same population.

Fig. 211.

Clettraval

Cluster Four: NAA samples 72, 81, 113, 73, 118, 117 and 121. Closest grouping: NAA samples 76... 87 (23 in total).

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	11.8	<0.0	14.1	29.6	<0.0	15.4
Accept Null hypo.	Yes	No	Yes	Yes	No	Yes

Null hypothesis: Cluster Four and the next closest grouping come from the same population.

Fig. 212.

Clettraval

Cluster Five: NAA samples 76, 80, 107 and 88.
Cluster Six: NAA samples 79, 111, 82, 85 and 98.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	2.2	0.1	16.7	19.7	94.7	37.0
Accept Null hypo.	No	No	Yes	Yes	Yes	Yes

Null hypothesis: Cluster Five and Cluster Six come from the same population.

Fig. 213.

Clettraval

Cluster One: NAA samples 71, 120, 93 and 119.
Cluster Two: NAA samples 86, 90 and 89.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	3.0	84.1	23.3	85.8	24.8	58.2
Accept Null hypo.	No	Yes	Yes	Yes	Yes	Yes

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 214.

Clettraval

Cluster One, Cluster Two and unassigned group 74....108: NAA samples 71, 120, 93, 119, 86, 90, 89, 74, 75, 83, 122, 104 and 108.
Cluster Three: NAA samples 94 and 100.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	46.4	<0.0	41.8	1.6	76.0	19.8
Accept Null hypo.	Yes	No	Yes	No	Yes	Yes

Null hypothesis: Cluster One, Cluster Two and the unassigned group come from the same population as Cluster Three.

Fig. 215.

Clettraval

Cluster Four, Cluster Five, Cluster Six, Cluster Seven, Cluster Eight and various outliers and unassigned groups: NAA samples 72.....103.
Cluster Nine: NAA samples 78, 92, 99 and 85.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	0.4	3.7	2.0	14.5	46.6	18.8
Accept Null hypo.	No	No	No	Yes	Yes	Yes

Null hypothesis: Cluster Four, Cluster Five, Cluster Six, Cluster Seven, Cluster Eight, various outliers and unassigned groups 72.....103 come from the same population as Cluster Nine.

Fig. 216.

Clettraval: Cluster Number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
71	86	Bay 4 L.L.	slightly everted and round	line of dimples on the neck angle
120	24	SW cor. M.L.	-------	wavy cordon
93	81	Bay 7 L.L.	-------	large incised chevrons
119	57	Surface	-------	cordon with arched plain line applied above

Fig. 217.

Clettraval: Cluster Number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
86	61	SW cor. M.L.	broken off	two parallel incised lines
90	66	Up. surface	-------	wavy cordon and three straight incised lines
89	9	Bay 3 M.L.	-------	faint channelling

Fig. 218.

Clettraval: Unassigned- Cluster 1 or 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
74	10	Bay 6 L.L.	-------	finger tip impressed cordon and channelled overlapping arches
75	40	Cent. area nor half M.L.	-------	large wavy cordon
83	79	Ext. Entrance	-------	cross hatch pattern of strokes
122	56	Bay 3 L.L.	-------	wavy cordon with short piece of attached clay below
104	69	Surface	-------	wavy cordon and two thin arched incised lines
108	119	Surface	flaring	----------

Fig. 219.

Clettraval: Cluster 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
94	41	Surface	-------	large wavy cordon
100	130	Cent. area SE quad M.L.	-------	probable base sherd

Fig. 220.

Clettraval: Cluster 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
72	27	Bay 3 L.L.	-------	large wavy cordon
81	30	Bay 3 L.L.	-------	wavy cordon
113	25	Bay 3 L.L.	-------	wavy cordon
73	12	Building C	-------	wavy cordon and three channelled faint arches
118	37	Outside ent.	-------	wavy cordon
117	23	Unknown	-------	wavy cordon
121	36	Bay 7 L.L.	-------	wavy cordon

Fig. 221.

Clettraval: Cluster 5

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
76	11	Building C	-------	wavy cordon and three channelled arches
80	1	SW quad L.L.	sharply everted	faint channelled chevrons
107	54	Bay 8 L.L.	-------	cordon with fine rosettes
88	7	Building C	-------	two faint, finely channelled grooves

Fig. 222.

Clettraval: Cluster 6

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
79	6	Up. surface	-------	two arching channelled curves
111	126	SW quad L.L.	-------	base from a small open bowl
82	4	Bay 8 L.L.	-------	channelled arches
95	80	Ent. L.L.	-------	part of six incised 'nested' chevrons
98	124	SW quad Unknown L.	-------	part of a base

Fig. 223.

Clettraval: Unassigned-Cluster 5 or 6

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
77	8	Bay 9 L.L.	-------	faint broad channelled lines
112	83	Building C	-------	brushed surface
109	46	Surface	-------	cordon in a filleted chain
84	63	Ext. ent.	everted, thin lip	incised lines in cross hatching

Fig. 224.

Clettraval: Cluster 7

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
91	88	Ext ent. L.L.	slightly everted	row of bosses on body
110	19	Building C	everted	wavy cordon in neck angle
105	20	Bay 7 L.L.	everted	wavy cordon in neck angle
115	97	Bay 3 L.L.	rolled and beaded	----------
114	117	Cent. area nor half U.L.	flattened	one channelled groove
101	85	Bay 5 L.L	-------	brushed curving lines
116	35	Bay 8 M.L.	-------	wavy cordon

Fig. 225.

Clettraval: Cluster 8

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
102	22	SW quad L.L.	-------	wavy cordon
106	68	Bay 4 L.L.	-------	wavy cordon and two thin arching incised lines

Fig. 226.

Clettraval: Outliers 87 and 103

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
87	59	Bay 9 L.L	-------	incised lines in a leaf pattern
103	38	Bay 4 L.L	-------	wavy cordon

Fig. 227.

Clettraval: Cluster 9

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
78	5	Bay 6 L.L	-------	one channelled curve
92	87	Cent. area nor half M.L.	out turning	line of dimples in the neck
99	55	Cent. area nor half M.L.	-------	cordon in a chain with a plain line underneath
85	62	Cent. area nor half M.L.	-------	closeset chevrons form a herringbone pattern

Fig. 228.

210-216) and the summaries of the cluster members are contained in Figs. 217-228. All the sherds in cluster 4 have wavy cordons, but since this is a common technique and occurs on many sherds in other clusters, it cannot be demonstrated to have a significance which can be identified from the archaeological record as well. Thus no context and no decorative technique is seen to be associated with a pottery fabric which is distinguishable from others on the same site and which is specific only to that type.

<u>The Site of Sollas.</u>

This wheelhouse site was situated on the 'machair leathann' or broad plain approximately half a mile to the north of the township of Sollas and Middlequarter. The presence of structures was recorded by Erskine Beveridge and a description was given of the investigations which were carried out both by him, and by the local inhabitants prior to his visit (Beveridge 1911, 121-129). He showed that the wheelhouse was comprised of 14 radial chambers and had an associated smaller oval structure which opened out from one of the bays. Artefacts which were recovered included part of a thin bronze pin, hammerstones, slag, a piece of worked bone and a small number of pottery sherds. The site was also recorded in 1928 with the publication of the Royal Commission volume of surveys in the Hebrides, in which reference was made to Beveridge's work and the comment passed that the site was no longer traceable above ground (RCAHM 1928, no. 272).

The more recent excavations were carried by Professor RJC Atkinson and unfortunately as of yet remain unpublished, although work is currently being undertaken with that aim in view. Until this is achieved the contexts and phases from which pottery sherds were recovered are not fully defined although the problem lies more in the unravelling of the relationships than in a lack of detail of individual layers. The excavations were undertaken on the main structure, wheelhouse 'B', on a smaller structure, wheelhouse 'A' and on a number of smaller squares. The general layout of the 14 bays of the main wheelhouse was confirmed as was the nature of the attached structure, cell 'A', the position of the hearth and several additional features were uncovered, including an aumbry opening off bay 5 (Fig. 229). The most unusual feature of the main structure, however, was the large number of pits sunk into the floors of the bays and the central area. These often cut into each other and varied in size, ranging for example, from the oval pit in cell 2 which was over a cubic yard in volume, to others which were only inches deep. The contents of the pits varied with burnt bone and pottery sherds being common, sometimes in conjunction, with one vessel containing a cremated sheep and another bizarrely containing several mouse skeletons. Clearly some unknown complex of ritual/social practices are involved, in this context the deer jawbone lined hearth from the wheelhouse of A Cheardach Bheag, South Uist may be recalled (Fairhurst 1971, 80).

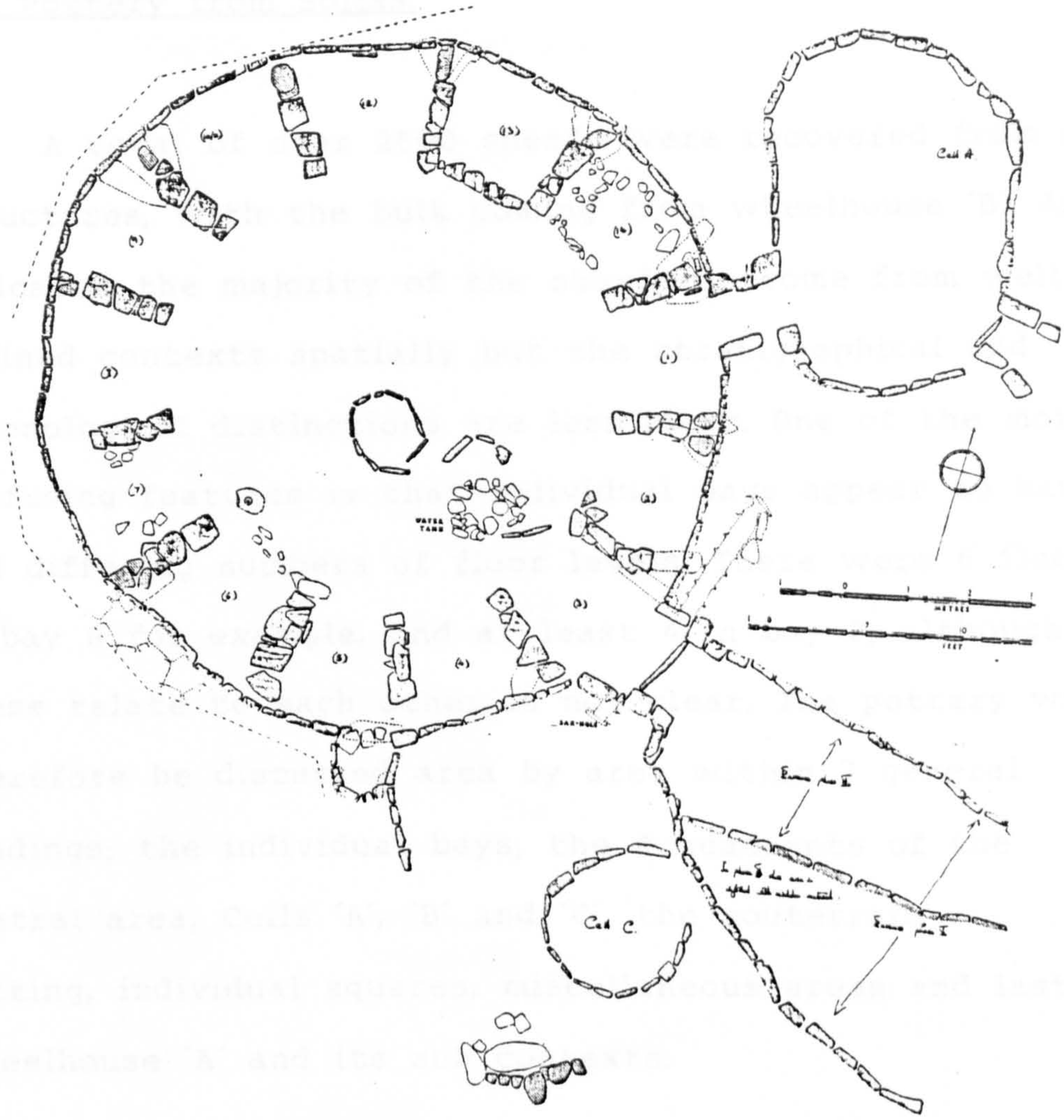


Fig. 229: Sollas site plan.

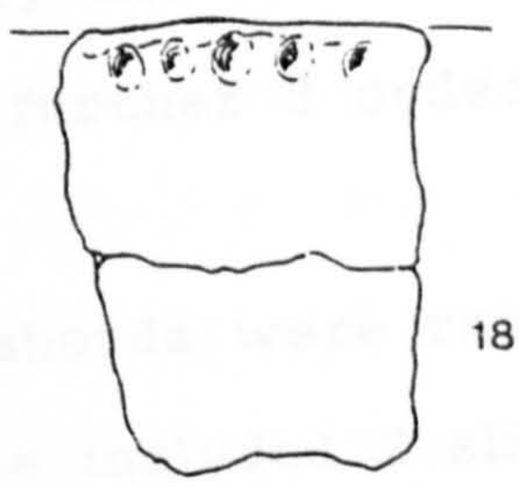
The Pottery from Sollas.

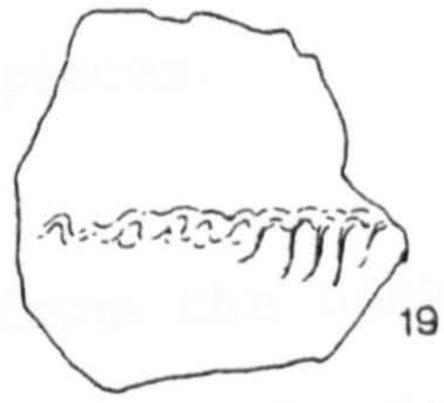
A total of over 2800 sherds were recovered from all the structures, with the bulk coming from wheelhouse 'B'. As indicated the majority of the sherds do come from well defined contexts spatially but the stratigraphical and chronological distinctions are less clear. One of the more confusing features is that individual bays appear to have had differing numbers of floor levels. There were 6 floors in bay 6 for example, and at least 4 in bay 2, although how these relate to each other is not clear. The pottery will therefore be discussed area by area within 7 general headings; the individual bays, the 4 quadrants of the central area, Cells 'A', 'B' and 'C', the souterrain cutting, individual squares, miscellaneous areas and lastly wheelhouse 'A' and its sub contexts.

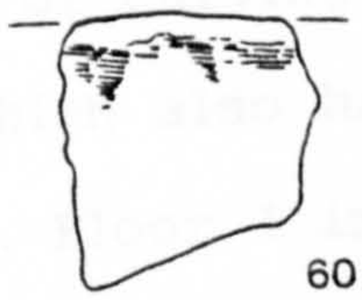
Pottery from Individual Bays, Wheelhouse 'B'.

Bay 1 contained a total of 105 sherds of which 69 derived from the uppermost floor (floor 1) and of these, 3 sherds displayed wavy cordons (nos. 1-2 and 8) and 1 a cordon modelled into a chain (no. 6). One sherd had a missing rim, probably originally everted or out turned (no. 4) and the remainder of the assemblage included two base sherds (no. 5) and 60 plain wall sherds. In and below floor level 1 were 2 sherds with wavy cordons (no. 11) and 14


17


18


19


60

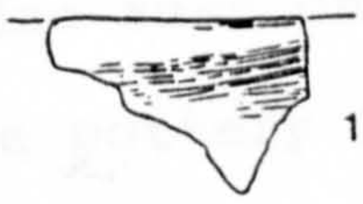

73

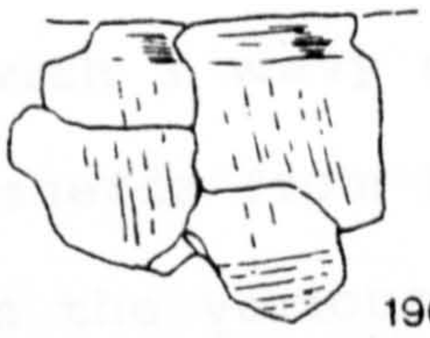

95

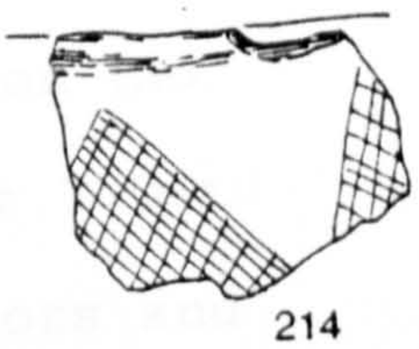

101


129


103


173


190


214


232

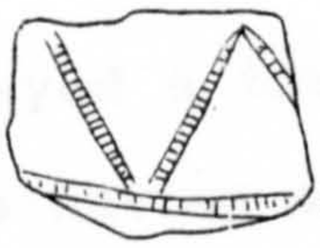

239


240


248


253


284


316


465

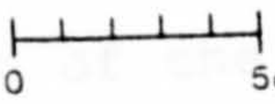


Fig. 230: Sollas pottery.

other wall sherds probably from that same vessel. Floor 2 contained 15 fragmentary sherds with a pit set into the floor level producing a further 3 undecorated pieces.

A total of 4 rim sherds were recovered from the back of the wall in bay 2, these included 2 slightly out turned with finger tip impressions just below (no. 15), one everted with a row of curving incised lines beneath (no. 17) and a flat rim which also had finger tip impressions below the rim edge (no.18). Floor 1 in bay 2 had an everted rim sherd with a deeply finger tip impressed wavy cordon and associated stab and drag marks (no. 19), while floor 2 had an everted rim with short incised lines (no. 26) and 1 flat rimmed sherd (no. 27). On floor 2 was a piece with a wavy cordon (no. 25), a decoration also seen on 3 sherds from floor 3 (no. 29). The rest of the pottery from the various floors and from the large pit comprised 3 parts of bases and 50 wall sherds. Bay 3 formed the entrance passage to the wheelhouse, this may be reselected in the recovery of only 6 sherds all of which were undiagnostic (no. 36)

Bay 4 contained a number of floors, each with associated pottery, 1 sherd from floor 1 had a sharply everted rim (no. 37) and another displayed a thin wavy cordon (no. 39). Floor 2 is described as having several sub contexts, these contained parts of 3 everted rims, of which 2 were sherds in which most of the rim was missing (no. 51), the third had a complete rim and a wavy applied cordon on

the body of the vessel with a thin grooved arching line above (no. 41). Also from floor 2 were 2 plain rim sherds (no. 50), 2 sherds with thick, wavy finger tip impressed cordons, (no. 49), 1 thin wavy cordon (no. 48), 4 other wavy cordons with finger tip marks and a single sherd with a row of slanting finger nail nicks creating a cordon effect (no. 52). From between floors 2 and 3 came 1 sherd which once had had an everted rim (no. 53) and another which had a row of finger tip impressions (no. 56). Floor 3 proper produced a sherd with a small and very fine row of transverse nicks (no. 43) and from floor 4 were derived 2 sherds which were everted rim neck angles (nos. 45 and 61), a flat rimmed sherd with a row of deep finger tip impressions just beneath (no. 60) and a single sherd which was decorated with a thin wavy finger tip impressed cordon (no. 46). Floor 5 contained 2 sherds with wavy cordons (no. 63) and in a context described as 'secondary peat layer' was found 1 everted rim (no. 66). A grass marked sherd with a row of slanting nicks giving a cordon effect (no. 58) and a sherd with an applied wavy cordon (no. 59) were unstratified having been disturbed by 'overnight visitors'. Undecorated sherds from the contexts described above and from others in bay 4 totalled 149 pieces.

The contexts in bay 5 also included a number of floors and in addition a small attached wall opening or aumbry. Recovered from the aumbry were a thin out turned lip with a very fine row of transverse finger nail nicks below (no.

70), 1 sherd with a slightly finger tip impressed wavy cordon (no. 71) and 2 sherds which were striated or grass marked (nos. 69 and 72). Floor 1 had 3 sharply everted rim sherds (no. 93), 2 sherds with worn wavy cordons (no. 94) and a sherd with a wavy cordon and large incised chevrons above (no. 95). Floor 2 had 4 rim sherds of which 1 was everted (no. 78) and 3 were thin and rounded (no. 80). A further rounded rim is from an unknown context (no. 87). Decorated sherds from floor 2 included 1 with a finger tip impressed wavy cordon (no. 79) and which also had short slanting incised lines (no. 91). Floor 3 had a brush marked sherd (no. 83), floor 4 a wavy cordoned sherd (no. 85) and a sherd with 8 rows of thinly incised parallel lines (no. 96). An everted rim was recovered from below floor 5 and the remaining undecorated sherds from the bay numbered 76 in total.

Pottery was recovered from 5 floor levels within bay 6 (floors 1-4 & 6). Floor 1 contained a thin rounded rim (no 98), a broken off everted rim (no 105) and a sherd with a sharply everted rim and a pinched up wavy cordon (no 101). Decorated sherds included wavy cordon (no 99), a cordon in a chain pattern (no 124), a cordon with vertical fingernail nicks on it (no 100) and a sherd with a shallow grooved and curving line (no 123). One part of a vessel had an applied wavy cordon with fingernail nicks on it and with an incised decoration of 'fir tree' type running off it vertically (no 103). The 2 rims from floor 2 were both everted (nos

108-109), no 109 also had a thin wavy cordon. Floor 3 had a rounded rim (no 128), an everted rim which displayed 4 narrow, uneven and curving incised lines beneath (no 129) and 9 sherds which formed the base and lower walls of a single vessel (no 120). A plain rim (no 116), a sherd with a row of slanting fingernail nicks giving a cordon effect (no 115) and an incised sherd with a line forming an elbow (no 117) were recovered from floor 4. No sherds can be ascribed to floor 5 and only 1 sherd, with an everted lip (no 112) to floor 6.

Only 2 traces of a rims were found in cell 7, one was only known to be everted by the survival of part of the neck angle (no 132), the other had a thin out turned lip and came from the third of the 4 pits sunk into the cell floors (no 148). Pit 1 contained a sherd with a thick fingertip impressed cordon, pit 4 held brush marked sherds (no 143) and pit 2 contained 2 sherds with closeset incised lines (no 139), 3 with applied cordons (no 144), 3 with inter crossing incised lines (no 146) and 1 sherd with both bore this latter type of decoration but in addition had a cordon (no 145). The first floor of cell 8 produced an everted rim (no 151), while another (no 160) and 2 plain rims were found in pit 2 (nos 159 and 161), of which no 159 displayed a complex of decoration including herringbone just below the rim with a worn wavy cordon and incised chevrons partially infilled with small dots. It is sherds such as this that make the wisdom of a defined sequence of decorative types more

difficult to believe in. Also from pit 2 was a piece of pottery with a decoration of part of a chevron infilled with incised lines (no 163).

Cell 9 was notable for containing at least 13 pits, of which pit 12 was only 5" in diameter and appears to have been dug to hold the small everted rimmed vessel found inside it (no 190). Every other rim sherd from the various pits and floors was of the everted type (nos 168, 173, 178 and 180). Several sherds bore applied wavy cordons (nos 169 and 175) and a number of others had a cordon with fingernail nicks (no 179) or had slanting strokes in a row (no 170). Part of a crucible was also recovered from pit 4 which was a small circular feature c 4" in diameter (no 182), while a more enigmatic find was the base and lower walls of a pot containing burnt bones and 2 mice skeletons in pit 8.

In the plan of the site drawn by Beveridge it was indicated that there were 14 cells in the structure (Beveridge 1911, 120), during Atkinson's excavations, however, it was demonstrated that there were only 13 and to account for this discrepancy 1 of the cells is labelled 10/11. Relatively few sherds were recovered from cell 10/11, those that were included 1 everted (no 195) and 2 thin rims (nos 198 and 201). 1 sherd had an applied cordon with fingertip impressions on it (no 193). Cell 12 produced everted rims from floor 1 and from a large pit (nos 205, 208, 213-214), with several other sherds displaying wavy

cordons (nos 206 and 209). Of the everted rims, no 214 had 2 incised chevrons which had been infilled with cross hatched incised lines (Fig. 230) and another sherd from an unknown context had lines giving a ladder effect (no 217).

Of the sherds from cell 13, both the rims were everted and both were from floor 1 (nos 218 and 220), 1 in addition had a lid ridge (no 218) not dissimilar to that from A Cheardach Bheag, S. Uist (Fairhurst 1971, fig 6, no 5). Decoration on no 220 consisted of several incised strokes with other sherds from under floor 2 and from the pits having applied wavy cordons (nos 224 and 229) with in 1 case being associated with a cross hatched pattern (no 232). From cell 14 were derived a variety of rim types including plain from floor 1 (no 234), everted from floor 2 (no 241) and thick and rounded from the large pit 1 (no 244). 4 sherds from floor 1 had applied wavy cordons (nos 236 and 238), another from pit 1 had a similar cordon with a series of infilled incised chevrons above (no 246) and 1 sherd from floor 1 had 2 shallow grooved arching lines meeting at an elbow (no 239).

<u>The central area.</u>

The central area of the main wheelhouse was excavated by quadrants, and of the rims recovered from the N.E., which contained at least 24 pits, only 1 was plain (no 259) and it was unusual for deriving from a pit and containing a

cremation. The remainder of the rims from the various N.E. contexts were everted (eg nos 248, 252-253 and no 260). Decoration in 1 instance consisted of a row of grain impressions in the everted rim neck angle (no 248), in others of 'Clettraval' ware (no 252) or incised decoration (nos 250 and 265) and in others still of the more common wavy applied cordon (eg nos 251 and 255). No rim sherds were recovered from the N.W. quadrant, although one notable sherd from floor 1 had a decoration of double applied cordons c 6 cm apart (no 314) and another piece from pit 22, which was the earliest feature, had a wavy cordon with incised chevrons above it.

The S.W. quadrant had 1 everted rim (no 288) and 1 everted lip (no 292), the latter coming from pit 15. In addition this sherd had short vertical strokes in the neck angle, with a maze of herringbone, incised chevrons and a plain cordon crossed by fingernail nicks beneath. The majority of the sherds, however, were from the floor level of the quadrant and of these wavy applied cordons (eg nos 287 and 293) occurred, as did 1 sherd with a pale yellow encrustation, perhaps due to an association with some form of iron object. The S.E. quadrant of the central area also contained wavy cordoned sherds (eg no 273), 1 of these had an incised feather pattern above and there were 2 everted rims (nos 270 and 280) and 1 plain (271). Other contexts labelled as cells 'A', 'B' and 'C' contained very few sherds, although 1 everted rim (no 322) and 1 wavy cordon

(no 323) were present. In addition all the 77 sherds from the souterrain were undiagnostic.

Middens and excavated squares.

A number of midden and other nefarious contexts seem to have been excavated at the same time as the main wheelhouse, structure 'B'. These include midden in square '13', square '35', square '61' and various areas near the wheelhouse entrance. The bulk of the rim sherds appear to have been of the everted type (eg nos 333, 339, 353 and 360), although plain rims (nos 346 and 365) as well as 1 rolled rim (no 347) were also represented. Decorated sherds include those types common from within the wheelhouse, namely wavy cordons (eg nos 335, 340 and 388), various incised patterns including feather (no 338), ladder (no 341), line and impressed dot (no 359) and chevrons (nos 366-367). Part of a clay mould for a ring headed pin c 2 cm across was also located (no 368), as was a large part of a vessel whose exterior was covered by a skin of clay 2.5 mm thick (no 390). The Pottery from Structure 'A'

In addition to the main wheelhouse a smaller, more ephemeral structure was also excavated, and although a plan exists the relationship of the pottery to contexts is not always clear. The delineation of phases within this area of structure 'A' is also not easy to identify, for this reason the pottery will be dealt with as a single assemblage,

although more detail on individual contexts may be found in the appendix to the chapter. The usual rim types are present with in addition several occurrences of the flat variety (eg nos 404 and 432). The sherds also possess many of the common decorative features including cordons (nos 399, 472 and 475), fingernail or fingertip impressions (nos 415 and 432), incised lines (nos 409, 425 and 441) in some cases giving hatching (nos 406, 414 and 509), chevrons (no 454), ladder (no 449) and more unusually small double applied bosses (no 422) and in 1 case ring pin stamping (Fig. 230) contained within and incised and impressed dot quadrilateral (no 465). The association of structures 'A' and 'B' is not explicit in the plans, and will not be until the full site report published, if even then, and other than to say that there are broad similarities in stylistic and decorative type in both sites would seem to involve speculation based on little evidence.

Chronology.

As has been argued for previous sites, to attempt to derive a chronological framework from the pottery alone seems unwise. At present the site report is still awaited with interest because the existence of the large number of pits set into the wheelhouse floors, in conjunction with the varied and sometimes bizare finds contained within them surely argues for a function for these structures of more than purely domestic type.

NAA results.

Twenty-two of the Sollas sherds were subjected to NAA, with the results of the clustering procedures being contained in Fig. 231 and with labelled contexts in Fig. 232. Figs. 233-236 give the 'twosample t' test values which indicated that there were 5 significantly different clusters with 1 outlier. No regular pattern of form or decoration is visible for the sherds which once formed parts of vessels, however, the dendrograms vividly show that the mould for the bronze ring headed pin is of a chemical composition not paralleled by other of the analysed sherds. The mould was unfortunately not from the main structure of the wheelhouse, but from a stratigraphically isolated square which cut into midden deposits. Consequently the exact relationship of the piece to the rest of the pottery from the site is not closely defined, but it can be argued that its chemical difference lies more in the nature of the object than its spatial or chronological separation from the rest of the assemblage.

Analysis of moulds and crucibles carried out within the National Museum of Antiquities' research labs has demonstrated the range of elements which can be detected as residues on prehistoric and historic metalworking clay artefacts. X-ray fluorescence spectrometry of over 25 samples has indicated that it is only the casting surfaces

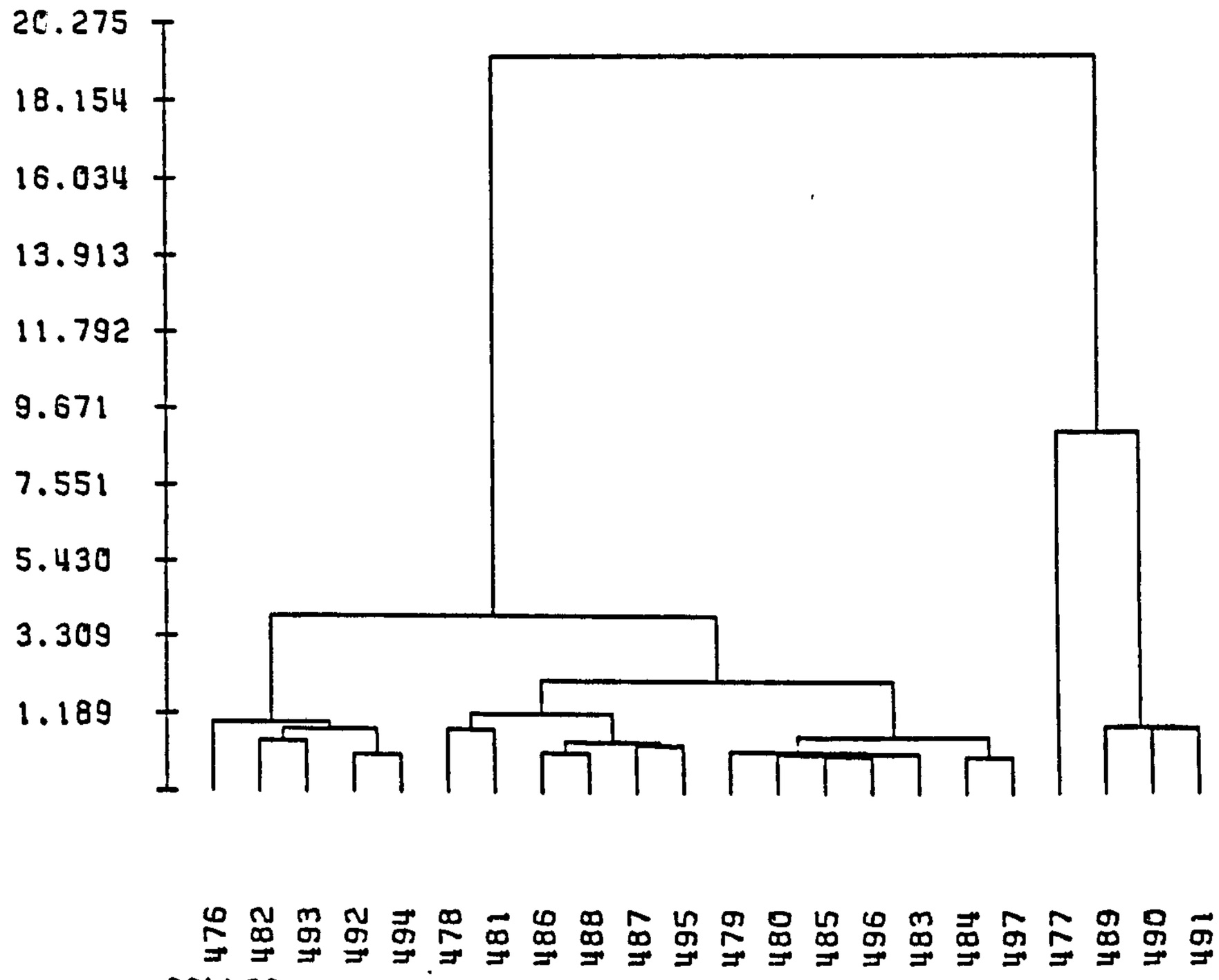


Fig. 231: Dendrogram of the sampled sherds.

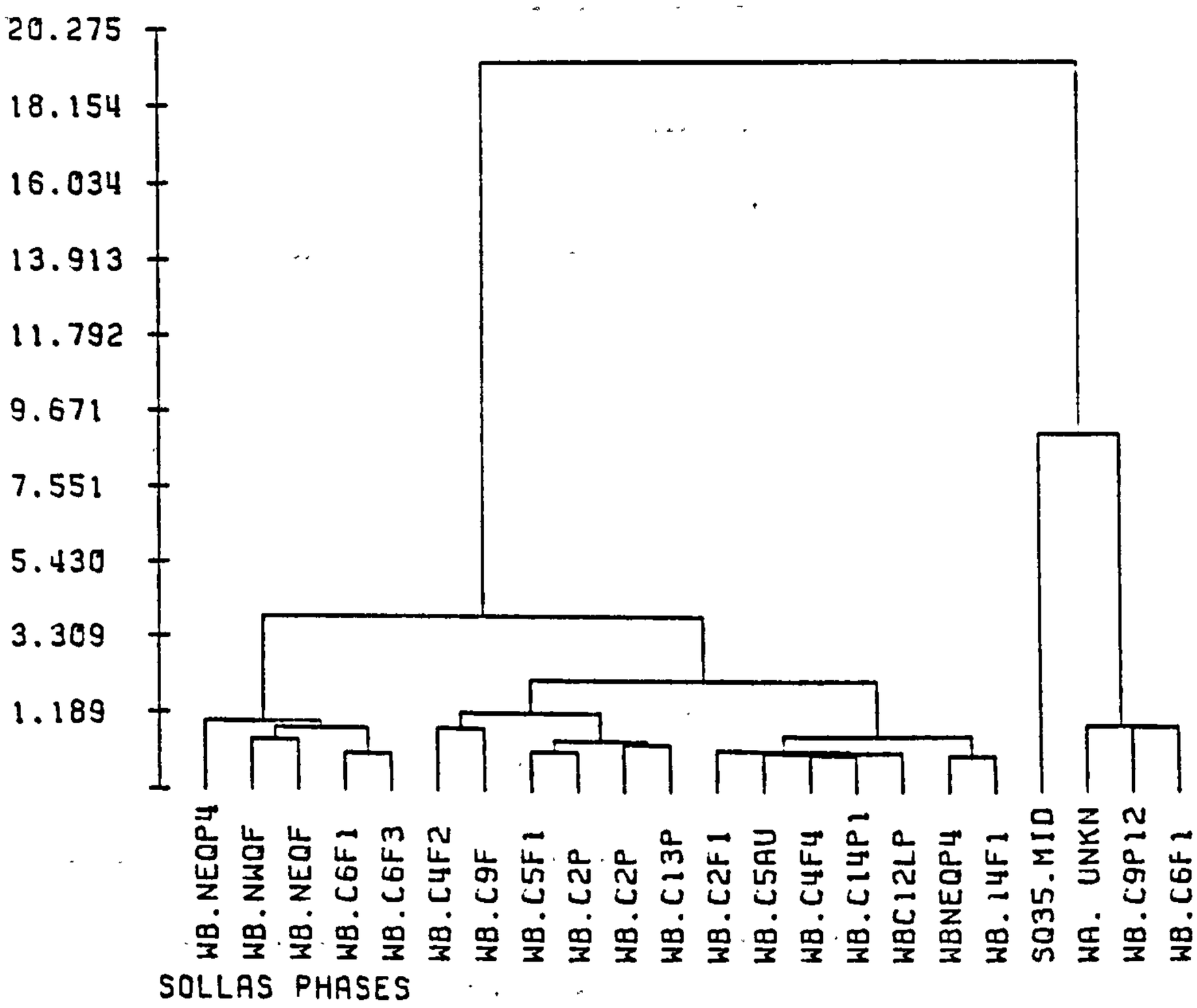


Fig. 232: Dendrogram of the sampled sherds, labelled by contexts.

Sollas

Cluster One: NAA samples 476, 482, 493, 492 and 494. Next closest grouping: NAA samples 478..... 497.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	0.4	2.1	0.4	0.5	68.1	1.5
Accept Null hypo.	No	No	No	No	Yes	No

Null hypothesis: Cluster One and the next closest grouping come from the same population.

Fig. 233.

Sollas

Cluster Two: NAA samples 478, 481, 486, 488, 487 and 495. Next closest grouping: NAA samples 479.....497.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	53.3	74.5	94.2	62.9	0.4	26.7
Accept Null hypo.	Yes	Yes	Yes	Yes	No	Yes

Null hypothesis: Cluster Two and the next closest grouping come from the same population.

Fig. 234.

Sollas

Cluster Three: NAA samples 479, 480, 485, 496 and 483. Cluster Four: NAA samples 484 and 497.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	9.9	0.8	14.8	73.5	8.0	54.5
Accept Null hypo.	Yes	No	Yes	Yes	Yes	Yes

Null hypothesis: Cluster Three and Cluster Four come from the same population.

Fig. 235.

Sollas

Cluster One, Cluster Two, Cluster Three and Cluster Four: NAA samples 476.....497. Cluster Five: NAA samples 477, 489, 490 and 491.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	<0.0	0.9	<0.0	7.9	68.9	8.5
Accept Null hypo.	No	No	No	Yes	Yes	Yes

Null hypothesis: Cluster One, Cluster Two, Cluster Three and Cluster Four come from the same population.

Fig. 236.

Sollas: Cluster Number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
476	284	WB cent. area SW quadrant	-------	part of a panel infilled with parallel straight lines and an area of herringbone
482	316	WB cent. area NW quadrant	-------	cordon with slanting fingernail nicks, zizag ladder pattern in chevrons above
493	248	WB cent. area NE quadrant	everted	row of grain impressions in the neck angle
492	103	WB cell 6, floor 1	-------	wavy cordon with fingernail impressions, part of 'fir tree'
494	129	WB cell 6, floor 3	sharply everted	four uneven curved incised lines below the rim

Fig. 237.

Sollas: Cluster Number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
478	52	WB cell 4 floor 2	-------	row of fingernail nicks giving a cordon effect
481	173	WB cell 9 pit 12	wide and everted	----------
486	95	WB cell 5 floor 1	-------	wavy cordon, incised chevrons above
488	18	WB cell 2 pit	flat	finger tip impressions in a row below the rim, brush marked
487	17	WB cell 2 pit	everted	row of curving incised lines below the rim
495	232	WB cell 13 unknown pit	-------	worn wavy cordon with remains of a cross hatch pattern above

Fig. 238.

Sollas: Cluster Number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
479	19	WB cell 2 floor 1	everted now gone	cordon withdeepfingertip impressions, stab and drag marks below the rim, brush marked
480	73	WB cell 5 aumbry flr	-------	wavy cordon with slight finger tip impressions on it
485	60	WB cell 4 floor 4	flat rim	deep finger tip impressions in a row below the rim
496	246	WB cell 14 pit 1	-------	wavy cordon and incised 'nested' chevrons
483	214	WB cell 12 large pit	everted	chevrons infilled with hatching

Fig. 239.

Sollas: Cluster Number 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
484	253	WB cent. area NE quad pit 4	everted	wavy cordon with faint grooved lines above
497	246	WB cell 14 pit 1	-------	worn wavy applied cordon, above a series of 'nested' chevrons

Fig. 240.

Sollas: Outlier Number 477

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
477	368	Square 35 cutting into midden outside wheelhouse B	-------	mould for a ring headed pin of of circa 2 cm in diameter

Fig. 241.

Sollas: Cluster Number 5

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
489	465	WA Unknown	slightly everted	quadralateral figure formed of double incised lines with rows of dots between the lines, ring pin stamp in middle of panel
490	190	WB cell 9 pit 12	everted	vertical brush marks on exterior surface
491	101	WB cell 6 floor 1	sharply everted	pinched up wavy cordon

Fig. 242.

of moulds which are affected by residues (Barnes 1984, 40) and that 4 major elements are involved, Lead, Zinc, Tin and Copper. None of these were detected for by NAA or therefore used in clustering in this research programme, and since the ring pin mould sample was taken from the section of the sherd, it is arguable that the difference which is seen in the CLUSTAN dendrogram is a real difference of source material rather than of contamination. The interpretation of this finding is not a straight forward matter, it could be that the clay for moulds is specially prepared, for example by suspension in water to remove grits and thereby improve the mould surface, or that clay moulds were produced from a raw material not normally utilised in the more mundane vessels of a site. In this context it may be remembered that the Dun Mor Vaul spearbutt mould was also an outlier in its parent cluster. Clearly the future analysis of other moulds would be required to confirm the pattern.

The Site of Balelone.

The site of Balelone was excavated by the Central Excavation Unit of the Scottish Development Department during the summer of 1983. The site was situated on an eroding sea cliff face and although the presence of 'erd houses' was recorded there on Beveridge's North Uist map (Beveridge 1911), very few remains of any substance were located during the excavation. The cliff face was excavated in a number of areas whose stratigraphy was linked to

produce the site section in Fig. 243 and while the structural remains may represent the final eroded parts of a wheelhouse such an interpretation is to some extent speculative. The site is as yet unpublished so that as for Sollas the description of the site and the levels from which pottery was recovered is not as fully discussed as will one day be possible. Briefly the site seems to have undergone several zones of occupation and natural alteration, with pottery deriving from the pre occupation levels, the levels of occupation and human influence (3a-3e) and the post occupation erosion areas. In the stratigraphy, the zones were subdivided into blocks and the blocks into individual contexts from which 656 pottery sherds of which many were undiagnostic fragments were recovered. The pottery will be discussed from the earliest to the later levels both within the blocks and within the site under the general categories outlined above.

Earliest Pre Structural Levels (zones 1-2).

The earliest levels on the site are represented by block 1027 and contain 5 sherds (nos 74-77 and 482); unfortunately all are undiagnostic wall pieces. A larger number of sherds derive from block 4 and from a context described as 'pit f4' which is probably part of the same block. Of the pottery, 2 are rounded rims (nos 45-46) of which no 45 has a decoration of small fingertip pinching below and 1 is square topped (no 358). Several are decorated

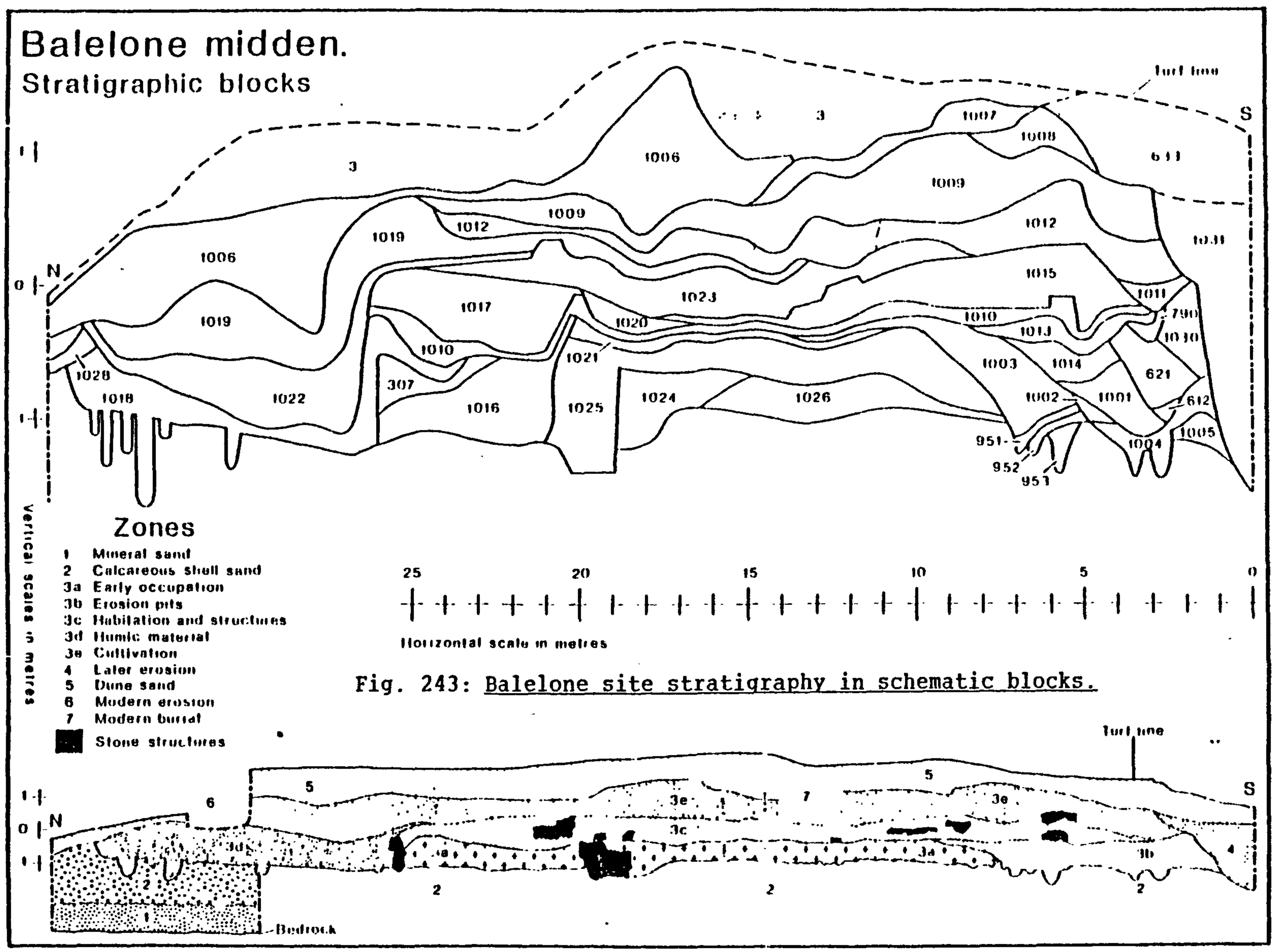


Fig. 243: Balelone site stratigraphy in schematic blocks.

including 1 with faint horizontal lines (no 47), another with a faint zigzag line (no 67) and more notably a sherd with an applied clay boss circa 12 mm in diameter (no 66). This is smaller than the usual Hebridean examples of this decorative trait. The other sherds from the early levels are undiagnostic (nos 38-44, 46, 61-65, 68-70 and 483).

Early Occupation Level (zone 3a).

Pottery from the early levels of occupation totalled 87 sherds and was recovered in blocks 307, 1016, 1024, 1025 and 1026. Two of the sherds in block 307 displayed thin out turned lips (nos 549-550) and the other piece from the context was undiagnostic (no 548), as were the 5 sherds from block 1024 (nos 279 and 294-297). Block 1016 contained only 2 sherds, of these no 556 had an iron encrustation on the exterior, possibly derived from iron pan: this sherd demonstrates well the dangers involved in using iron as an elemental indicator when analyzing with NAA. The majority of the sherds from the level, however, came from block 1025, some 76 in total of which only 2 were rims, 1 thin and plain (no 275) and the other square (no 387). Bases were represented by sherds nos 272-273 and 361. Very few exhibited decoration, those that did included low incised grooves meeting in a point (no 274), 5 fine incised lines possibly caused by grass marking (no 344) and simple grass marks on no 372). Only 1 sherd was located in block 1026 and this was no 349, which was a basal angle.

Level of Early Erosion Pits (zone 3b).

The pottery from this level derived from blocks 621, 1001, 1003, 1004 and 1030. Of the total of 24 sherds 3 rims were present, no 524 had a row of fingertip impressions along the rim edge, no 528 was slightly inturned and no 529 was everted. Of the decorated pieces, 2 had applied cordons (nos 522-523), of which no 522 with fingertip impressed and 1 sherd bore a fingertip impressed hollow (no 575).

Level of Habitation and Structures (zone 3c).

The blocks from which pottery derived from this zone included 1010, 1013/1014, 1015, 1017/1020, 1021 and 1023. Block 1010 contained 1 possible rim sherd (no 413) and 2 definite ones (nos 426 and 449) which both had impressions along the rim edge. Several of the sherds had rough external surfaces (eg nos 410-412), 1 had an applied cordon with deep transverse nicks (no 656) and 1 base had a pattern of thumb prints on the interior of its bottom in a fashion very similar to that from A Cheardach Mhor, S. Uist (Young and Richardson 1960, fig 6, no 37). Block 1013/1014 had 1 thin everted rim (no 502) and another which was slightly inturned (no 487). Incised or scored lines were visible on 2 sherds (nos 494 and 499), grooving on 1 (no 504) and an applied cordon with fingertip impressions along it on 1 other (no 488).

Only 3 sherds of note were recorded from block 1015, 2 plain rims (nos 328 and 337) and 1 burnt sherd with the remains of a cordon (no 329). Block 1017/1020 only contained 2 sherds, of which 1 displayed clear building joins (no 280). Amongst the 52 pieces from block 1021, at the junction between the habitation and the earlier occupation levels, a single sherd was of a rim, no 628 which was square in character. Several sherds had incised or grooved decoration (nos 251, 254 and 262) of which the decoration on no 262 consisted of slanting, almost rilled, incised lines on the interior of the vessel. Sherd no 649 bore part of a thick applied plain cordon and sherd no 646 had 2 unusual raised rectangular projections with deep grooves on them, perhaps forming part of a very heavy and deeply slashed cordon. Rim sherds were more numerous from block 1023 which contained several square ones (eg nos 150, 152-153, 154 and 585), 1 slightly inturned (no 158), 1 thin and out turned (no 250) 1 originally everted (no 241) and 2 which were flat or square and slightly projecting (nos 178 and 234). Of the body sherds a number were striated, perhaps with brush marks, which were not an uncommon feature of the site. A number of sherds displayed fingertip impressed or slashed cordons (eg nos 180, 193, 205 and 215), 2 sherds had part of an incised 'ladder' pattern (no 216 and 227), of which no 216 had an impression of a circular object circa 11 mm across, probably a ring headed pin.

Levels of Humic material and Cultivation (zones 3d and

3e).

The blocks which contained pottery and which were located within these levels were 1012, 1018, 1022, 1019 which lay across zones 3d and 3e and lastly 1009. Of a total of 20 sherds from block 1012, 3 were rims; 1 slightly out turned (no 81) with impressed dots 4mm wide below, 1 square (no 82) and 1 flat and slightly projecting with a row of fingertip impressions just beneath (no 580). Of the remainder, no 555 had a complex of decoration consisting of an applied cordon with deep vertical nicks, and above it a row of incised chevrons with 2 impressions of an oval object such as a ring headed pin circa 10 mm across in the apices of the chevrons and the spaces between the chevron peaks infilled with a line of stabbed dots. The pottery from block 1018 numbered 5 sherds (nos 542-546), all undiagnostic. A single sherd was located in 1022 (no 554), it was also unremarkable. The sherds from block 1019, however, totalled 28 pieces and although no rims were present, several had applied fingertip impressed cordons (nos 86, 90 and 557). Another sherd had a cordon with deep vertical nicks (no 551), 1 had incised lines forming a chevron (no 563) and 1 had a fingertip impressed cordon with an inverted chevron formed by 2 incised ladder patterns meeting at an elbow (no 558). Layer 1009 produced only 6 sherds, 1 was decorated with shallow grooves (no 391) and 1 was a basal angle with the base missing (no 79).

Later Erosion, Upper and Surface Levels (zones 4-6).

Block 1031 represented the layer of later erosion in zone 4 and although 15 sherds were recovered none were diagnostic (nos 467-481), as was also the single sherd from the upper dune layer (zone 5) of block 1007 (no 390). The block 3 surface and turf levels of zone 6 contained 1 sherd with a cordon with small chevrons running along it. A parallel with this is provided by a sherd from the lower levels of bay 7 at Clettraval, also N. Uist (Scott 1948, PL XII, no 2). Sherds which formed 4 parts of what was probably a single vessel with chevron decoration were also recovered (nos 48-51). The rim of this vessel was out turning and the chevron was formed by triple incised lines.

Chronological Considerations.

Balelone is one of the few excavated Western Isles sites to have C^{14} dates for any of the contexts within it. The dates were taken from samples obtained from block 1026 (GU-1801), block 1006 (GU-1802) and block 1005 (GU-1803). These respectively are from zones, 3a the early occupation, 3e the cultivation and 3b the erosion pits. It had originally been hoped that the dates would be sufficiently far apart in years BC and AD for the sampling of the intermediate contexts to be a viable proposition; the closeness of the calibrated dates, however, shows that this would not have been of value. The three C^{14} dates were

derived from shell samples and consequently the 'reservoir' effect has to be taken into consideration before calibration, as the immediate marine environment in which the shellfish lived is believed to have had an 'apparent age' ranging from about 300-600 years. This consideration entails that the confidence intervals in real years within which any date is expressed are bound to be much greater than those for conventional dates and this range is demonstrated in Fig. 244.

Given the misuse which there has been of C^{14} dates from other sites in the Western Isles, it would seem correctly cautious to approach the calibration of the Balelone series with a view to obtaining a date range which can be argued as justified at the expense of being broad. Thus for the 3 samples the date ranges which should perhaps be considered are those provided by the lowest 300 year and highest 600 year reservoir effect. The sample from block 1026 of early occupation is thus dated to between 180 BC and AD 430, from block 1006 of cultivation between 165 BC and AD 455 and from block 1005 of erosion from 405 BC to AD 395. It can thus be seen that statistically the 3 date ranges could have been derived from samples of the same real year age. Individually, however, when taken in regard to the contexts from which they were derived it can be argued that the period of the dated usage of the site is from the early second century BC to the mid fifth century AD. This confirms, but does not refine the chronology which would be

suggested by the general pottery sequence on the evidence of other Western Isles sites.

NAA results.

Originally 25 sherds from Balelone were sampled for NAA but owing to the disintigration of one of the plastic sampling ampoules during irradiation only 24 were subsequently fully analysed. The dendrogram which was derived from the results is shown in Fig. 244, with the labelled contexts and block numbers in Fig. 245. Figs. 247-248 demonstrate the existence of only 3 clusters which are significantly different from each other and the characteristics of the sherds are given in Figs. 249-251. Cluster 3 can be seen to be greatly different from the others in the dendrogram and the 2 sherds which comprised it (nos. 216 and 217) are distinguished by having very high La levels of circa 150 ppm, a value greatly in excess of that found in every other sherd from the Hebrides with values typically in the 15 to 30 ppm range. The salutary lesson is that it is only because of detailed recording of the excavated straigraphy that the archaeological pattern behind these sherds may be seen. The sherds derive from different vessels, their common feature is that they were both located in context 21 of block 1023, the habitation and structural level. The implication is than in context 21 an unusual clay source was being utilised for pottery production and that the sherds were either produced

differently for some reason or were brought in from a source not exploited during other times of the site's usage. There must be other sherds from other sites in the Hebrides whose pattern is obscured by the poorness or lack of the recording system employed at the time of excavation.

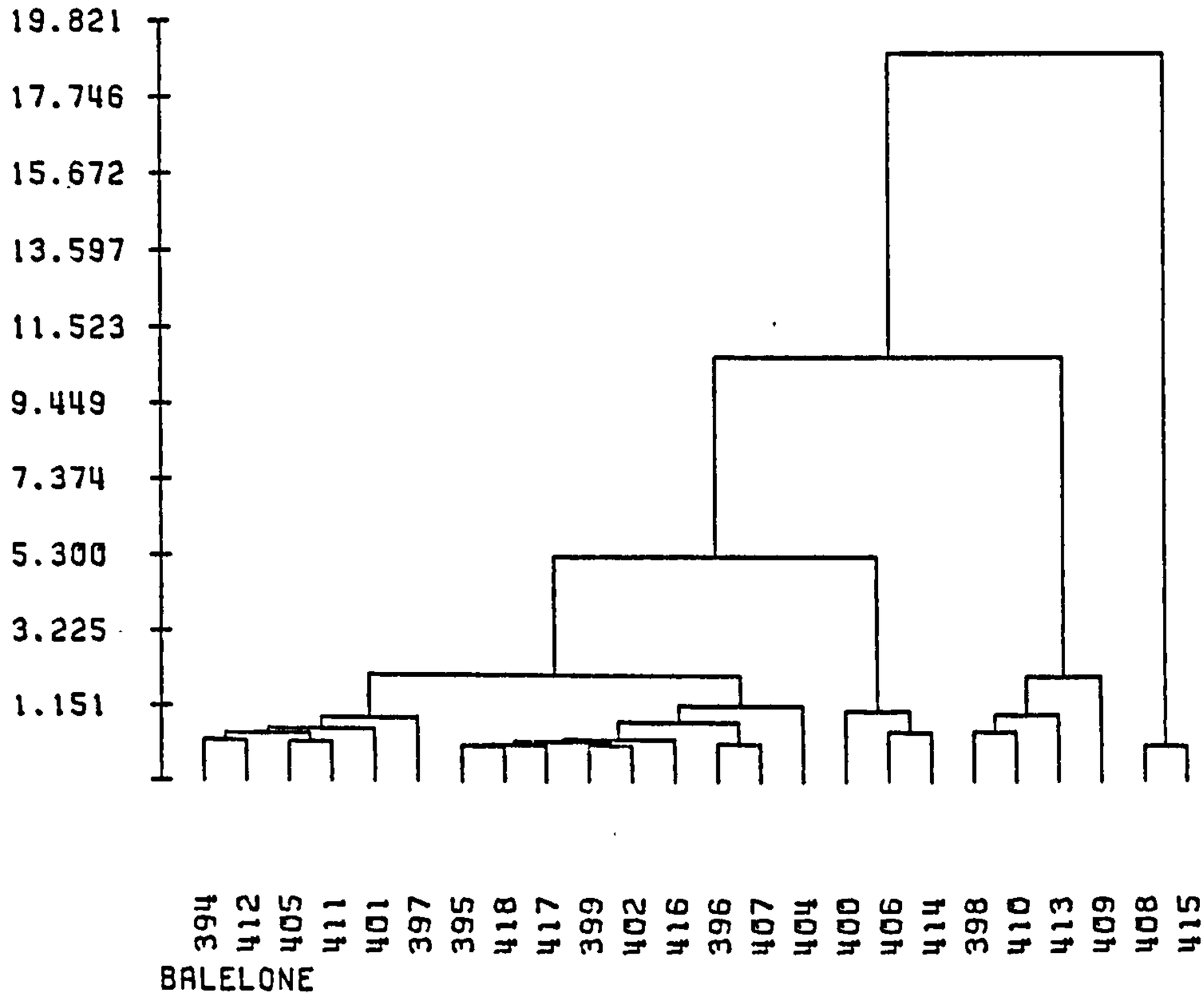


Fig. 244: Dendrogram of the sampled sherds.

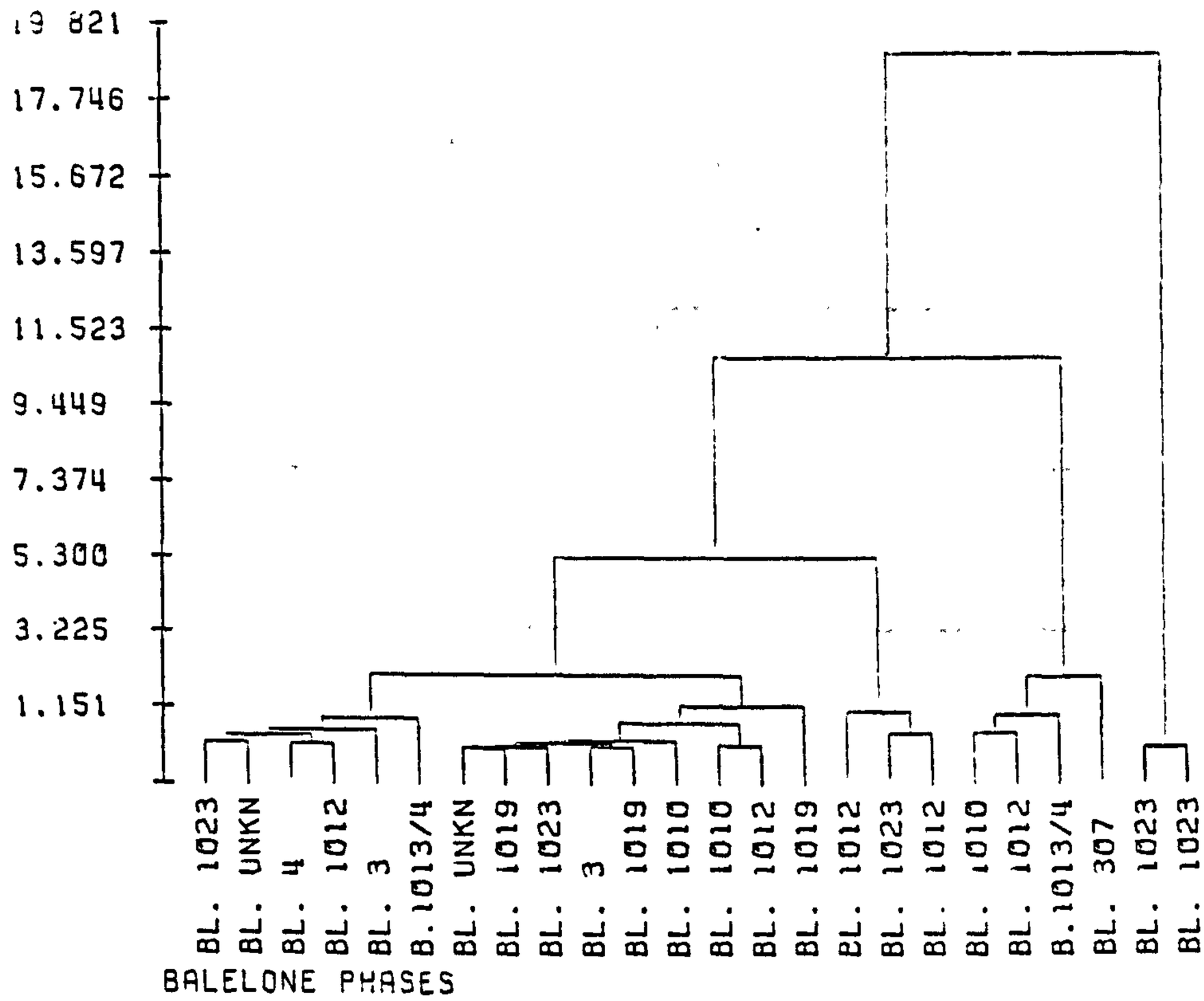


Fig. 245: Dendrogram of the sampled sherds, labelled by block or context.

The Calibration of the C-14 Dates from Balelone, N. Uist (Klein et al 1982).

Block and Zone.	Yrs bp and ad	300 Year Reservoir Effect	600 Year Reservoir Effect
GU-1801 Block 1026 Zone 3a	2330 ± 70	180 BC-AD 195	AD 65-AD 430
GU-1802 Block 1006 Zone 3e	2290 ± 60	165 BC-AD 210	AD 85-AD 455
GU-1803 Block 1005 Zone 3b	2440 ± 80	405 BC-AD 30	20 BC-AD 395

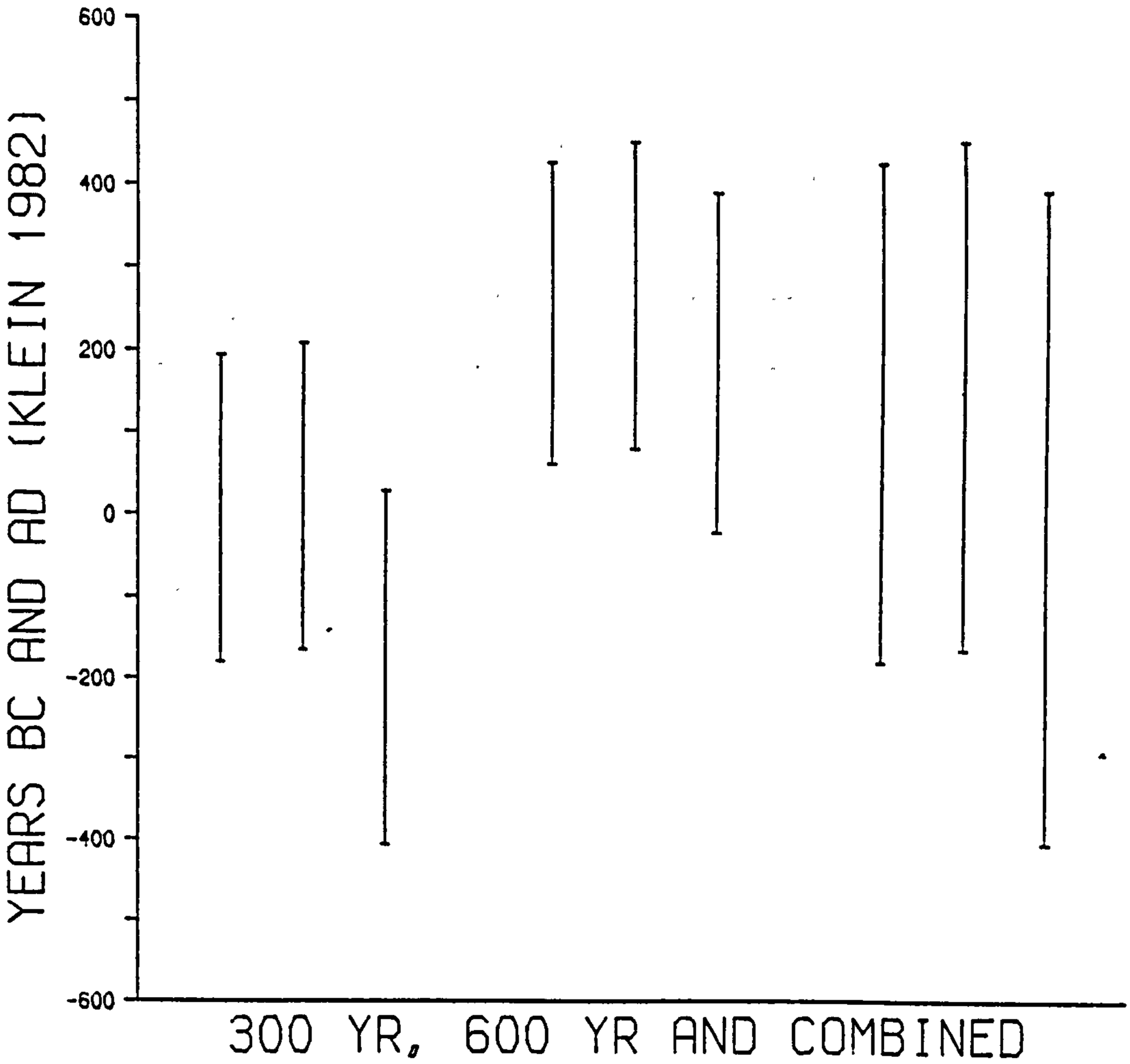


Fig. 246.

Balelone

Cluster One: NAA samples 394, 412, 405, 411, 401, 397, 395, 418, 417, 399, 402, 416, 398, 407, 404, 400, 406 and 414. Cluster Two: NAA samples 396, 410, 413 and 409.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	7.4	21.9	14.5	7.5	6.7	4.6
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 247.

Balelone

Cluster One and Cluster Two: NAA samples 394, 412, 405, 411, 401, 397, 395, 418, 417, 399, 402, 416, 396, 407, 404, 400, 406, 414, 398, 410, 413 and 409. Cluster Three: NAA samples 408 and 415.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	<0.0	<0.0	<0.0	<0.0	<0.0	<0.0
Accept Null hypo.	No	No	No	No	No	No

Null hypothesis: Cluster One and Cluster Two come from the same population as Cluster Three.

Fig. 248.

Balelone: Cluster Number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
394	233	Block 1023	-------	black int. burnished appearance, horizontal brush marks
412	71	Block Unknown	-------	thick applied cordon with deep finger tip impressions on it
405	66	Block 4	-------	small applied boss
411	83	Block 1012	-------	black, burnished appearance, brush marked
401	52	Block 3	-------	applied cordon with small chevrons running along it
397	488	Block 1013/14	-------	applied cordon with finger tip impressions on it
395	306	Block Unknown	plain rim	rough outer surface
418	559	Block 1019	-------	plain applied cordon
417	238	Block 1023	-------	thick applied cordon with deep vertical nicks
399	51	Block 3	out turned	triple incised lines form a large chevron, grain impression
402	558	Block 1019	-------	applied cordon with finger tip impressions, above an inverted chevron formed by incised ladder pattern
416	449	Block 1010	plain	row of finger tip impressions along the rim top
396	530	Block 1010	-------	base with an internal pattern of thumb prints
407	580	Block 1012	flat and projecting	row of finger tip impressions below the rim
404	86	Block 1019	-------	thick applied cordon with finger impressions on it
400	82	Block 1012	square	heavily grass marked
406	180	Block 1023	-------	cordon with vertical nicks
414	81	Block 1012	slightly out turned	row of impressed dots below rim each 4mm across, grass marked

Fig. 249.

Balelone: Cluster Number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
398	426	Block 1010	vertical	stab marks made by a small oval object along rim top
410	555	Block 1012	-------	applied cordon slashed by deep vertical nicks, above incised lines form chevrons, ring pin stamps in and between chevrons
413	502	Block 1013/14	thin and everted	----------
409	549	Block 307	thin, lip out turned	----------

Fig. 250.

Balelone: Cluster Number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
408	216	Block 1023 context 21	-------	impression of a circular object, perhaps a ring headed pin. deeply incised ladder pattern
415	217	Block 1023 context 21	-------	applied cordon with finger tip pinching

Fig. 251.

Chapter Eight: The Isle of Lewis.

'The Soil is generally sandy, excepting the Heaths, which in some places are black, and in others a fine red Clay; as appears by the many Vessels made of it by their Women; some for boiling Meat, and others for preserving their Ale' (Martin 1716, 2).

Geological background.

The Isle of Lewis has given its name to the rocks which dominate the geology of the Outer Hebrides. The Lewisian complex, forms part of a much larger crustal block stretching as far as Greenland and were already in existence 2800 million years ago (Smith and Fettes 1979, 77). Over a subsequent period of some 1000 million years, processes of deformation and metamorphism altered the nature of the rocks and have obscured some of the distinctions, so that in some areas there are still uncertainties as to the exact framework of the geological history. These processes have been divided into 2 broad periods, the Scourian and the Laxfordian; the latter terminating in the massive thrust which produced the Outer Hebrides Thrust Zone and lead to the creation of the mountains along the eastern seaboard of the Uists. On Lewis itself this general pattern is followed except for the area around Stornoway where thick beds of sedimentary sandstones and conglomerates exist as a result of a down faulted block of Mesozoic age.

In the glacial history of the island it was long accepted that Geikie's hypothesis that the Outer Hebrides

were overrun by an ice sheet from the mainland and travelling in a WNW direction was correct (Geikie 1873). This, however, was difficult to explain given the distribution of glacial erratics which only occurred in the northern and southern parts of the island chain. Recent work demonstrated that some erratics actually moved eastwards and this has been followed by a study of glacial striae which has indicated that the phenomena are best explained by the existence of a local icecap in the northern Harris and southern Lewis area (Flinn 1978). This interpretation was challenged by Sissons (1980) who argued that an ice sheet did move westwards from the mainland and that the eastward moving striae could be explained by a period of reversal of ice movement caused by an isostatic depression of the seabed in the Minches. The debate is not yet settled and there may well be a case for a local icecap on Lewis during the last glaciation.

Clay samples from 2 locations on Lewis were taken for NAA and x-ray diffraction analysis, 1 from Barvas and 3 from Carloway. The NAA results indicated that the clays were very similar in the concentrations of the elements analysed for, this perhaps reflects that the beds were deposited by the NW moving ice sheet during the last period of glaciation. Such an interpretation is supported by the alignment of striae in W Lewis (Flinn 1978, fig 1a) and by the x-ray diffraction results. Both the clays from Barvas and Carloway were grey and gritty in character and they possessed an identical set

of minerals, which included albite, tremolite, quartz, chlorite, muscovite, montmorillonite and potassium feldspar. The composition of the Barvas clay has significance for the production of pottery in the Western Isles, because while it would perhaps not be conventionally described as a good potting clay, it is known to have to have been the raw material for a very wide and successful range of later medieval and modern vessels, better known in the islands as crogans (Cheape 1983). The implication follows that other Western Isles clays which were sampled may have been perfectly satisfactory for pottery production too, despite their lack of kaolinite and other of the better known clay minerals.

History of Archaeological Investigation.

Although Lewis is the largest of the Hebridean Islands, it has received less archaeological attention than those further south in the island chain. This imbalance may be in part due to the efforts of Erskine Beveridge in Coll, Tiree and North Uist, but may also have been caused by the differences in topography between the islands. Lewis largely lacks the machair landscape of the Uists, which was both attractive to settlement and more open to erosive forces which lay bare the archaeological deposits. In contrast, much of the later prehistoric settlement on Lewis seems to have taken place within the many lochs of the island, and by their nature these island duns/brochs/crannogs are not

easily accessible to investigation, as the early Royal Commission surveyors admitted (RCAHMS 1928, V). The existence of stone built forts was noted by Martin Martin (1716, 8) who believed that the word 'dun' derived from the Gaelic word 'dain' and which signified a fort. Many of these constructions were examined in some detail by Captain F.W.L. Thomas RN as a part of his more general scheme of classifying the duns of the Hebrides (Thomas 1890). A more detailed survey of these and other monuments, was completed by the RCAHMS and published in 1928.

The site of Dun Carloway.

Dun Carloway is one of the four tallest standing brochs, yet surprisingly it is not specifically mentioned by Martin Martin who normally took care to describe such things in his late 17th century tour of the Western Isles. The site was considered in some detail by Captain Thomas, who recorded its height in 1861 as being 34 feet (1890, 383) and who by analogy with the work output of contemporary stone dyke builders, estimated it could have been constructed by 60 people in just over 100 days. Needless to say, the calculations by which this figure was arrived at, were rather more subjective than is desirable. A further account of the site was given in 1904, in which the site was classified as a 'shore dun' (MacKenzie 1904) and by the time of the Royal Commission survey (1928, no 68) the height of the structure had already decreased by almost 11 feet

(Graham 1947, 84). The plan produced by the surveyors was not altogether accurate and has been shown to be erroneous with particular regard to the inter mural galleries and cells (Tabraham 1979, 156). The more recent plan produced by Tabraham was part of a wider project in which excavation in one of the wall cells preceded masonry consolidation on the north eastern section of the broch exterior.

The small excavation was conducted entirely within chamber A and uncovered a series of layers of ash and earth totalling 70 cm in depth. Several of the layers had associated hearths and the small finds consisted almost entirely of pot sherds. The excavator located several voids which extended from the chamber into the broch wall, and these he interpreted as being utilized as flues, with the chamber functioning as a form of pottery kiln (Tabraham 1979, 160-161) in some ways analogous to that on the Calf of Eday, Orkney (Calder 1939). The pottery from Dun Carloway was examined by Dr. Close-Brooks (Close-Brooks 1979, 161-167), who drew parallels with the assemblages from Dun Cuier, Barra and A Cheardach Mhor, S. Uist, suggesting a date in the 5-7th centuries AD. From the argument pursued in the foregoing chapters of this thesis, the pottery alone is perhaps not a sufficient indicator for the definition of this date and the potential length of the sequence of the chamber's usage is perhaps indicated by the C^{14} date which the excavator calibrated to AD 1400 $\pm$ 150.

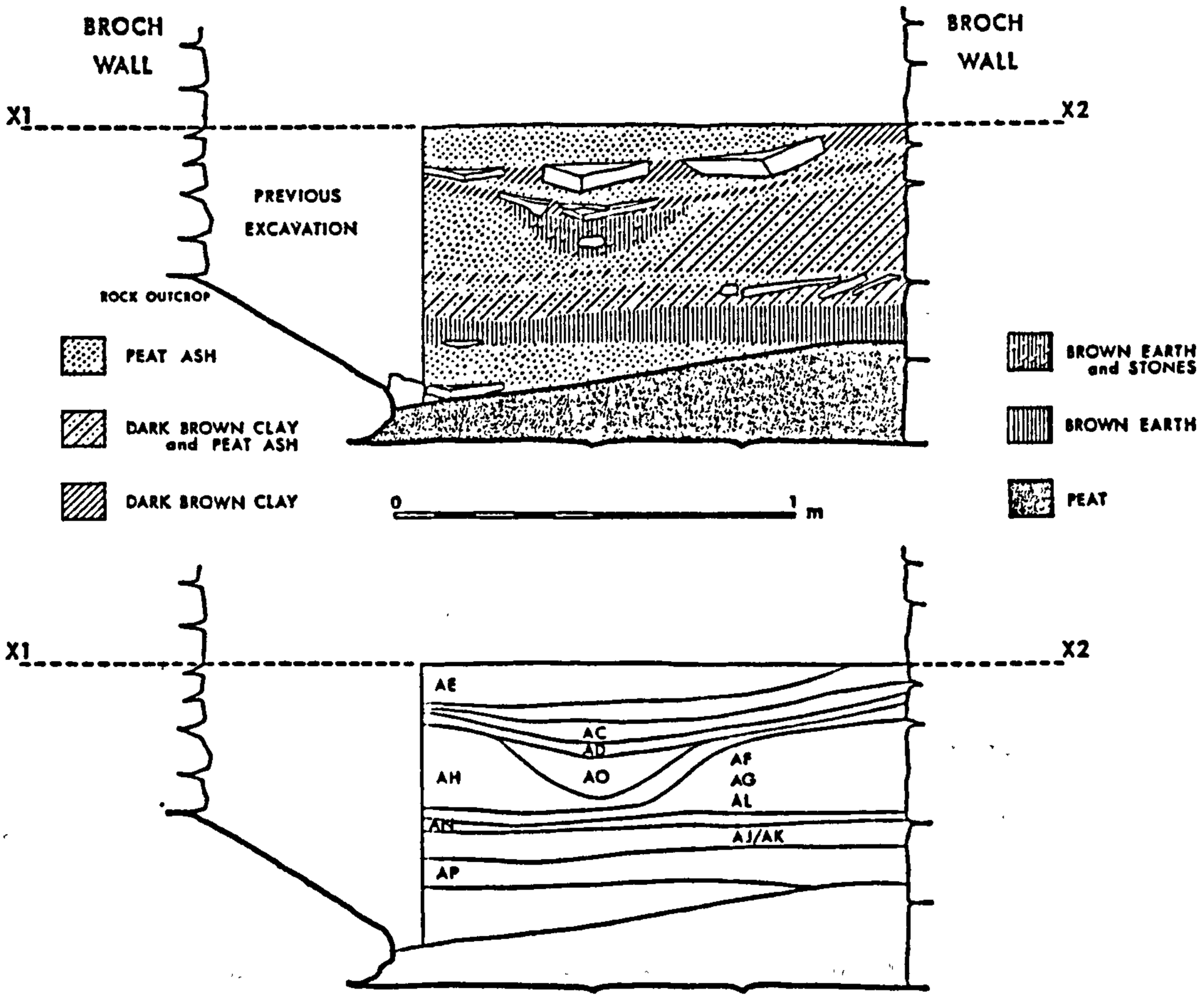


Fig. 252: Dun Carloway cell stratigraphy.

The Pottery from Dun Carloway.

The site section reveals that a number of different levels were distinguished by the excavator in the deposit and most of these contained pottery. The lowest level from which sherds were recovered was AP, a brown earth deposit overlying peat ash. It contained 20 sherds (Fig. 253), amongst which everted (nos 5 and 9), plain (nos 6-7 and 10), out turned/flaring (no 13), rounded (nos 8 and 11) and flat (no 12) rims were represented. No formal decoration was preserved on the these, or on the remainder of the sherds, although several did bear grass marks. Layers AK and AJ seem to have been essentially a single deposit of brown clay and peat ash which contained 59 sherds, most of them undiagnostic walls or bases (no 22). Of the rims that were present, however, 1 was thin, pointed and flaring (no 16), 1 was out turned (no 19), 1 was flat and out turned (no 20) and 1 was a thick and flat and derived from an open bowl type of vessel. Applied wavy cordons were present on 4 small sherds (no 21). Overlying AP, AK and AJ was a thin layer of peat ash, layer AN which in addition to 20 wall sherds, contained a small flat topped rim (no 24) and a flat rim from an open bowl (no 23) similar to no 17.

Contexts AL, AG and AF were all part of a wedge shaped deposit of dark brown clay and peat ash which tailed off to a thin spread on the north eastern side of the chamber. The layer contained the bulk of the pottery sherds from the

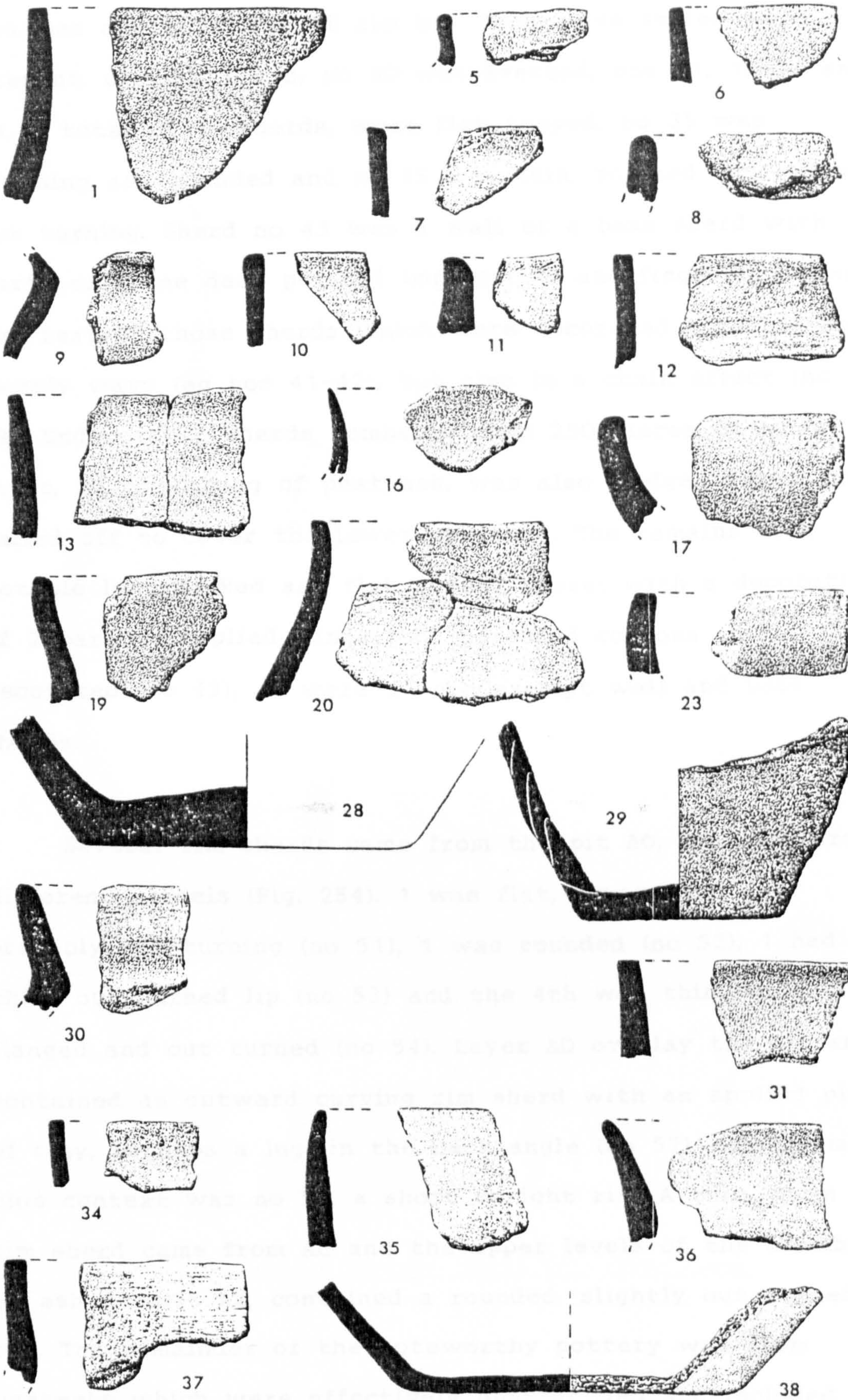


Fig. 253: Dun Carloway pottery. Scale 1:2 (after Close-Brooks 1979).

chamber and a variety of rim and decorative styles were present. Of rims types, no 30 was everted, nos 31, 33-34 and 44, a total of 10 sherds, were flat topped, no 35 was thinning and rounded and no 35 was thin, pointed and sharply out turning. Sherd no 43 was a wall or a base sherd with parts of three deep pointed impressions and fingertip marks, the rest of those sherds which were decorated bore cordons, mostly wavy (eg nos 41-42), but also in a chain effect (no 39). Undecorated sherds numbered over 250 pieces. The next layer, AH consisting of peat ash, was also wedge shaped and tailed off to cover the lower contexts. The remains of a notable long necked and flat topped vessel with a decoration of 2 parallel applied, fingertip impressed cordons were recovered (no 49), as were 67 nondescript wall and base sherds.

Several rim sherds came from the pit AO, all were from different vessels (Fig. 254). 1 was flat, square and probably out turning (no 51), 1 was rounded (no 52), 1 had a thick out turned lip (no 53) and the 4th was thin, wide flanged and out turned (no 54). Layer AD overlay the pit and contained an outward curving rim sherd with an applied piece of clay, perhaps a lug, in the neck angle (no 57). Also from this context was no 58, a short upright rim. A thin, plain rim sherd came from AC and the upper levels of the chamber, an ash deposit AE, contained a rounded, slightly out turned rim. The remainder of the noteworthy pottery was from contexts which were effectively unstratified and included

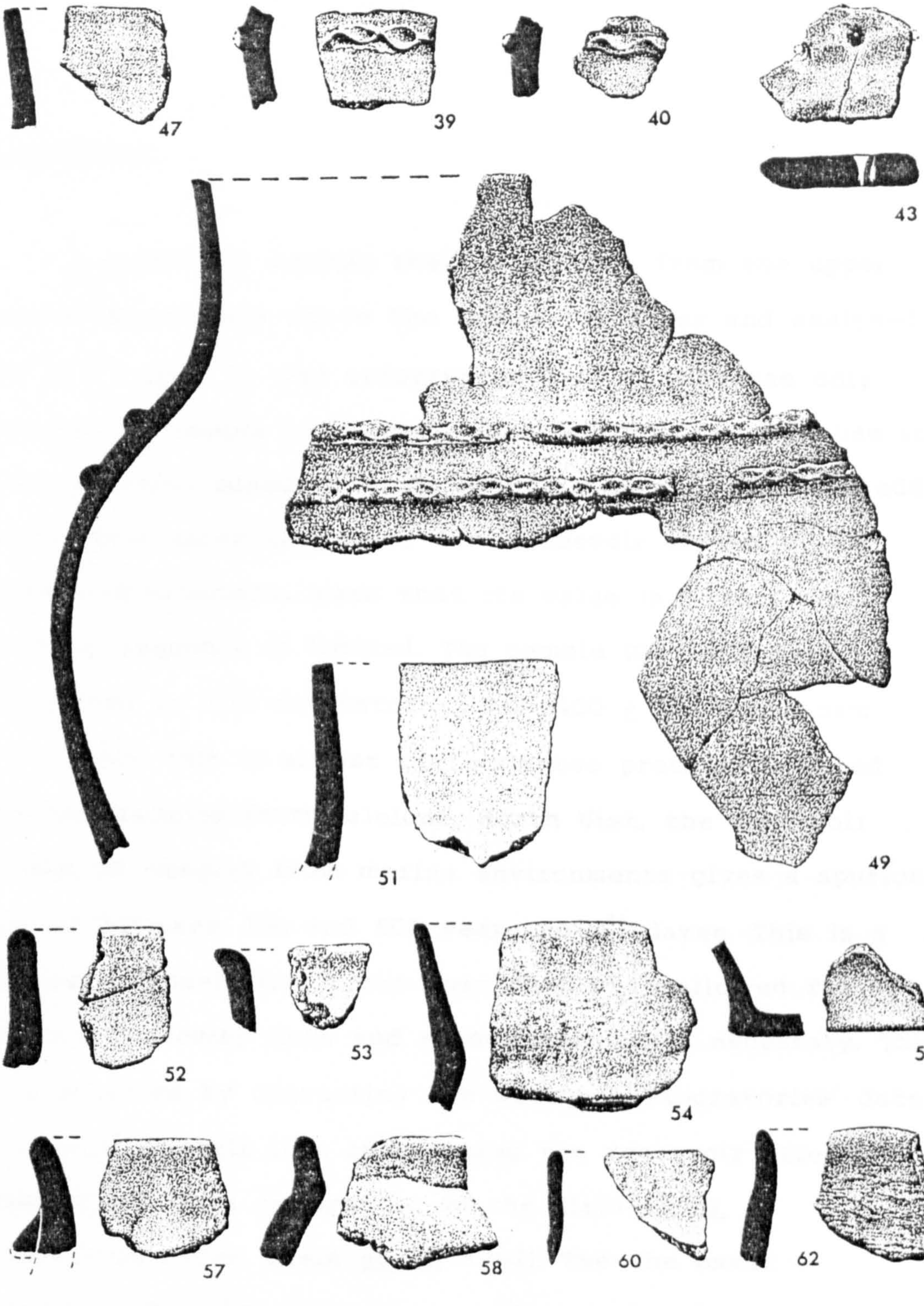


Fig. 254: Dun Carloway pottery. Scale 1:2 (after Close-Brooks 1979).

rims which were outward flaring (no 1) and flat topped (no 2).

Chronology.

A sample of mollusc shell was taken from the upper levels immediately above the latest ash layer and analysed for a C^{14} date. It was unfortunate that it was the only sample and sample type which could be obtained, because its context being mixed with modern trample and with the added statistical uncertainties of the 'reservoir effect' of the marine environment, mean that its value in dating the pottery sequence is limited. The sample (GX 3428) was calibrated by the excavator to AD 1400 ± 150 (Tabraham 1979, 160), this is almost certainly too precise. As noted for the samples from Balelone, North Uist, the reservoir effect of samples from marine environments gives a spurious age of between 300 and 600 years to C^{14} dates. This is a greater chronological error span than that allowed for in the Dun Carloway date and a recalibration is necessary. This was achieved by converting the Geochron Laboratories' date to the Libby half life, subtracting the reservoir effect figures and then calibrating on the Klein et al. calibration curve (Klein et al. 1982). The the exact allowance for the apparent age of seawater is not known, but it seems prudent to assume an effect at the greater end of the scale; accordingly as can be seen in Fig. 257 the recalibrated date from Dun Carloway ought to lie between AD

1325-1950 at the 2 sigma confidence level.

The implications of this are several, for example the date is conventionally much too modern for the pottery types recovered, yet the association of the sample with the sherds is uncertain and the recovery of later artefactual material from other sites, indicates secondary mediaeval and modern settlement of such sites is not unusual, so that the deposition of the molluscs may be connected with a secondary usage of the chamber and not necessarily be in any way coeval with the pottery. Secondly if one were to accept Dr Close-Brooks' dating of 5-7th century AD for the pottery and if the shells are associated with secondary mediaeval settlement, then clearly the stratigraphy must in part at least, be chronologically well separated over small distances measured vertically in the section. This is an argument against adopting blanket chronology from other sites to the Dun Carloway pottery; to see the collection as an assemblage to be paralleled elsewhere may be illusory. Further, such differences in periods of occupation were not a feature compatible with the excavator's view of the stratigraphy (Tabraham 1979, 169).

On a slightly different tack, if one accepts the excavator's interpretation of the chamber as a kiln and of the voids as kiln flues, then by necessity these being in the lower levels of the broch structure, must be primary features of its construction. It is possible that they are

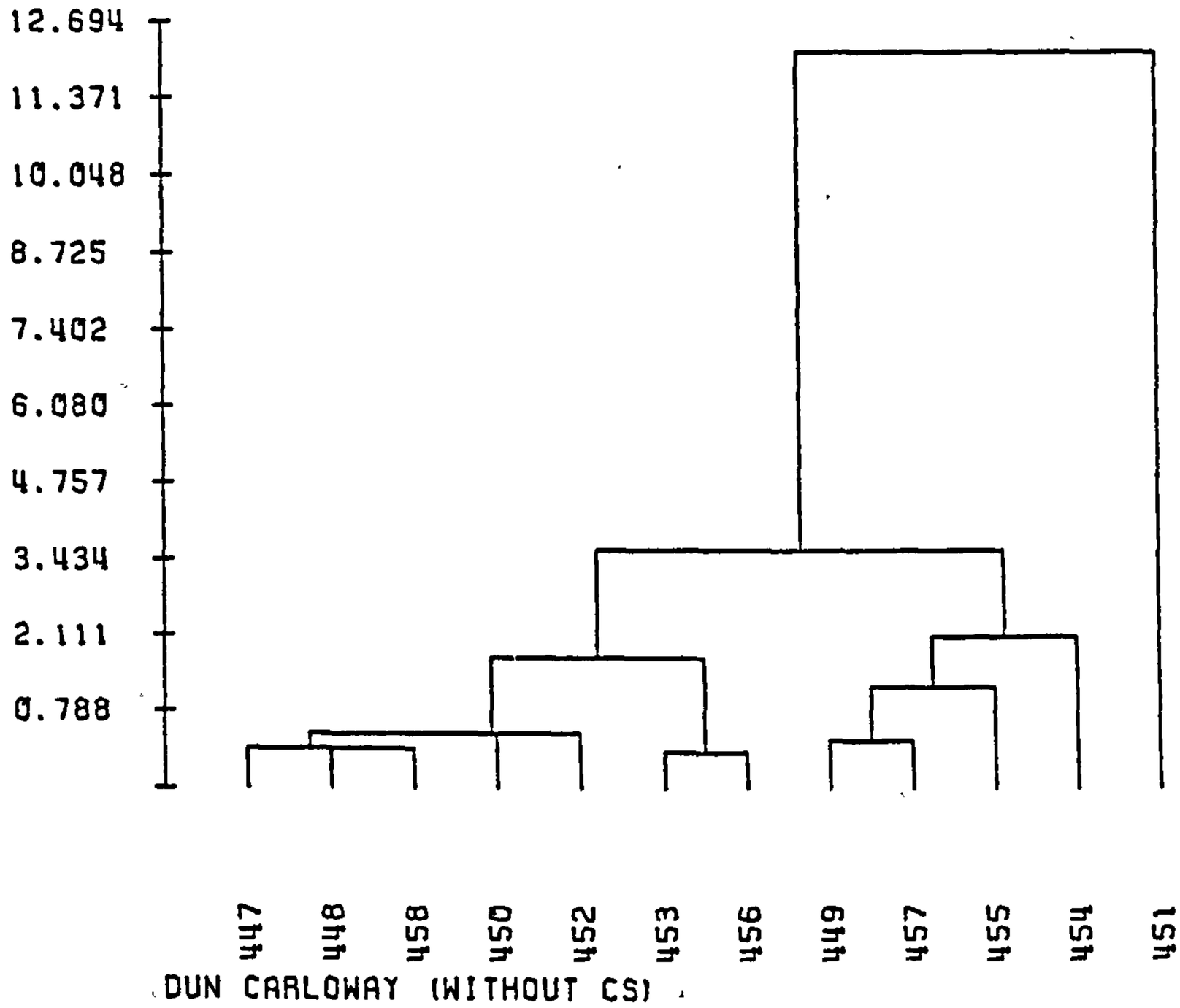


Fig. 255: Dendrogram of sampled sherds.

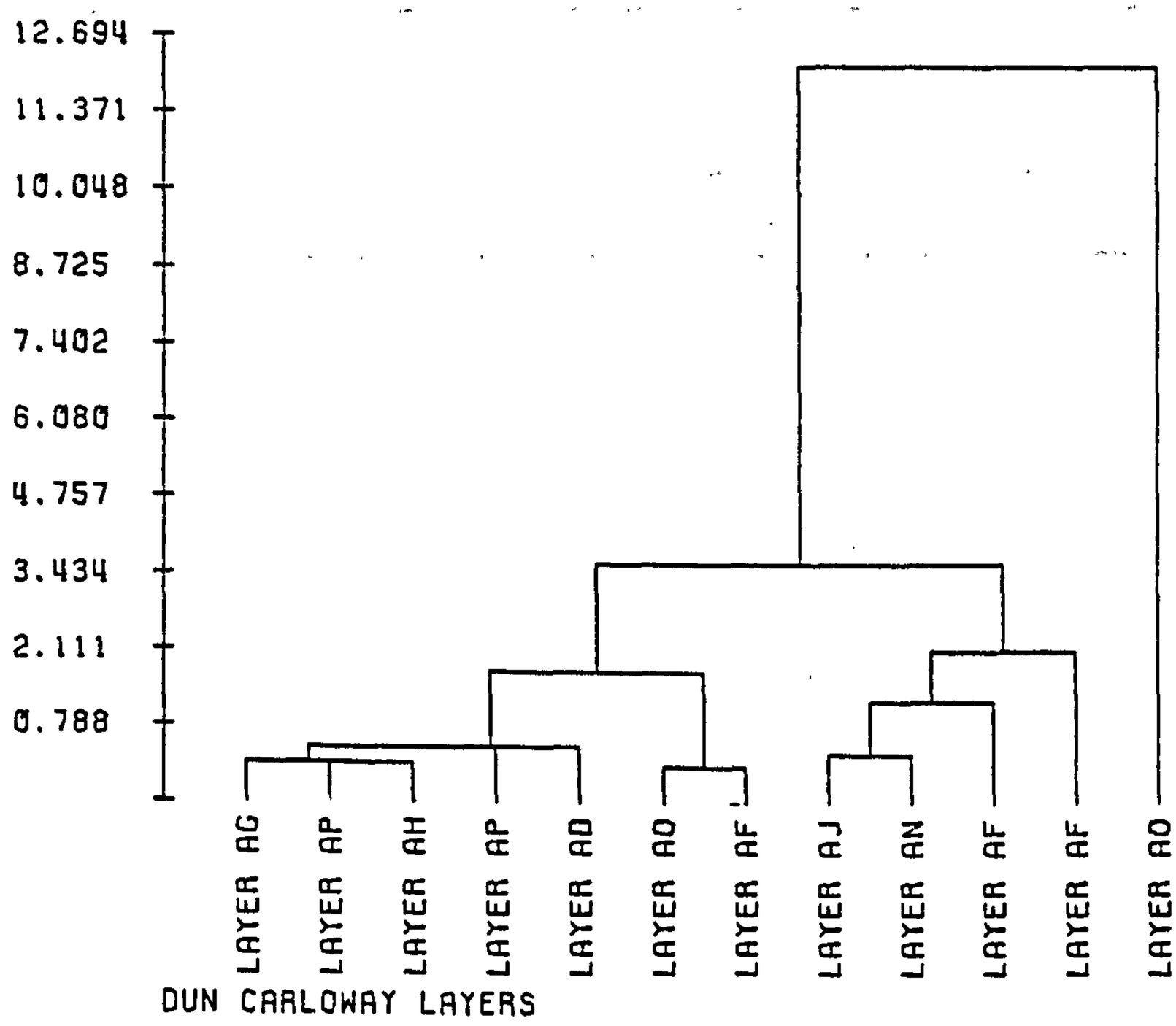


Fig. 256: Dendrogram of sampled sherds, labelled by layer.

Calibration of the C-14 Date from Dun Carloway, Lewis (Klein et al 1982).

Geochron Lab. Sample	Yrs. bp and ad (Libby)	300 Year Reservoir Effect	600 Year Reservoir Effect
GX-3428	688 ± 150	AD 1325-1950	AD 1505-1950

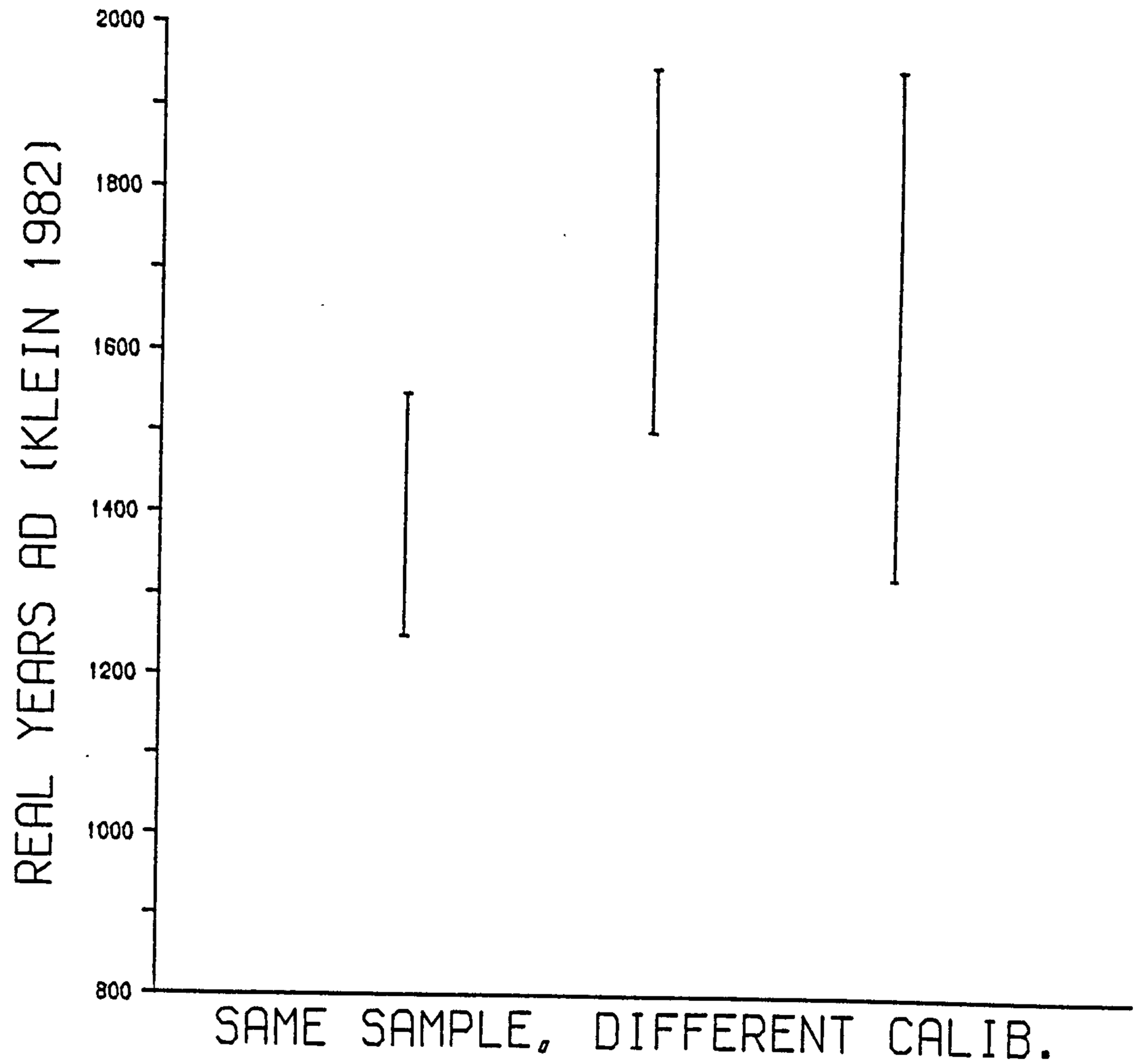


Fig. 257.

Dun Carloway

Cluster One: NAA samples 447, 448, 458, 450, 452, 453 and 456. Cluster Two: NAA samples 449, 457, 455 and 454.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	10.8	9.4	4.95	3.0	20.7	2.8
Accept Null hypo.	Yes	Yes	No	No	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 258.

Dun Carloway: Cluster Number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
447	30	Layer AG	everted rest gone	----------
448	12	Layer AP	flat	interior grass marked
458	49	Layer AH	out turned flat topped long neck	Two finger impressed cordons on the shoulder, both chain effect, exterior wiped
450	9	Layer AP	everted neck angle	----------
452	57	Layer AD	rounded	curious protrusion, perhaps lug
453	54	Layer AO	out turned wide flange	----------
456	40	Layer AF	-------	wavy cordon

Fig. 259.

Dun Carloway: Cluster Number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
449	20	Layer AJ	out turning and flat	----------
457	23	Layer AN	flat topped	----------
455	39	Layer AF	-------	zigzag cordon, pinched to give a chain effect
454	43	Layer AF	-------	three deep impressions in sherd wall, grass marked

Fig. 260.

Dun Carloway: Outlier Number 451

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
451	53	Layer AO	out turned lip	----------

Fig. 261.

put-log holes but it is difficult to see why in the case of void 1 a timber which was 25 cm^2 and set over a metre into the wall should be required in a mural chamber. However, if the voids were designed to function as flues, the 5-7th century date for the pottery is rather later than might generally be accepted for broch construction in Scotland and so one might be forced to conclude that the chamber may have been cleared of its earlier occupation debris. The difficulty perhaps lies in the currently perceived pottery chronology, if that is revised the dating problem may be found to be a non sequitur.

NAA results.

Twelve sherds from Dun Carloway were subjected to NAA with the results of clustering given in Fig. 255 and labelled by contexts in Fig. 256. Fig. 258 indicates that there were only 2 clusters and 1 outlier which were significantly different from each other, and the composition of these groupings is given in Figs. 259-261. There is no immediately visible archaeological pattern in the clusters and while no. 53 (NAA sample 451) is of a different rim type the reason for its being so much of an outlier is not clear. Part of the problem may lie in the statistically very small number of samples analysed from the site.

Chapter Nine: The Isle of Skye.

'With him we went to see an ancient building, called a "dun" or borough. It was a circular enclosure, about forty-two feet in diameter, walled round with loose stones, perhaps to the height of nine feet. The walls are very thick, diminishing a little towards the top; and though in these countries stone is not brought far, must have been raised with much labour.'

(Johnson 1817, 106)

Geological Background.

Skye was originally part of mainland Scotland, but was disconnected by processes of denudation and crustal movement. Its underlying geological structure is different from the Outer Hebrides, in that it has not been affected to any large extent by the metamorphism associated with the Lewisian gneisses. The island displays a number of characteristics which are typical of the plutonic and igneous rocks of Tertiary age in the Western Highlands. These are the basalt plateaux composed of basic lavas and intrusive sheets of dolerite which lie in the north west, the large mass of gabbro, a coarse grained, dark coloured igneous rock which forms the Cuillins and thirdly the granite of the Red Hills (Peach and Horne 1930, 8-9). Sedimentary rocks exist in the south east of Skye and consist of sandstones, grits and Upper Lias deposits containing marine fossils, a fact noted by Martin Martin (1716, 133). During the periods of glaciation Skye possessed its own independent icecap and deflected part of the westwards moving ice from the mainland to the north along

the inner Sound of Raasay.

The 3 sites from which samples were taken for NAA and x-ray diffraction all lay in the north west of the island and gave broadly similar results. The range of minerals which were located by x-ray diffraction was noticeably smaller than that for the rest of the Western islands which were analysed. The samples were derived from near the archaeological sites of Dun Iardhard near Dunvegan, Dun Ardtreck on Ardtreck Point and from Dun Beag near Struan. All contained montmorillonite and probably diopside with Dun Beag and Dun Ardtreck possessing zeolite and Dun Iardhard and Dun Beag having albite. Diopside, albite and zeolite readily occur in basic volcanic rocks and their presence is not unexpected. Montmorillonite, one of the poorer of the clay minerals, moreover, is produced as a consequence of the weathering of basic igneous rocks in area of poor drainage, it too is therefore not unusual.

<u>History of Archaeological Investigation</u>.

Skye being the largest and perhaps one of the more accessable of the Western Isles, has a long history of archaeological investigation and recording, with much of the early information being amassed as a by-product of the popular 18th and 19th century Tours. Martin drew attention to the major features of the stone forts of Skye; namely their round shape, stone walls and inter mural passages.

These structures were labelled 'duns' which he supposed was a corruption of the name 'Dain', indicating his belief that they belonged to the period of Scandinavian migrations. Their function as beacons was also discussed (Martin 1716, 153). During the visit of Dr Johnson and Boswell to Skye the existence of prehistoric structures was a subject of investigation with remains near Ullinish being described in particular detail (see above), this may have been the broch of Dun Beag near Struan. The site was excavated between 1914 and 1920 by the Countess de Latour (Callander 1921), and was in addition to her investigations at Dun Iardhard, Dunvegan in the pre war years (MacLeod 1915). The prehistoric sites of the island were recorded in some detail by the Royal Commission survey (RCAHMS 1928), but although comprehensive that this was aimed to be, archaeological inquiry was clearly on a less intensive scale than that on the Outer Isles.

This was in part revised by the work undertaken in the 1960's by Dr EW MacKie, who perceived Skye as being an area of great importance in the evolution of the broch structural sequence, with nineteen certain and probable brochs, more than the rest of the western part of the Atlantic province put together (Mackie 1965). He envisaged that semi-brochs, a term first coined by Beveridge, were the broch precursers of proper brochs, with the hypothesis relying on architectural features and being tested by the excavation of Dun Ardtreck in 1964. Recent work on the island has included the visiting

of all the small defended structures and their attempted classification as 'dun houses' and 'dun enclosures', a model proposed by Harding (Harding 1984) and applied by MacSween (1982).

The site of Dun Iardhard, Dunvegan.

The site is variously spelt Dun Iardhard, Dun An Iardhard or Dun Fiadhairt; in any case the Gaelic meaning is that of the fort on an exposed or windy headland. It was one of the earliest of the brochs to be excavated on Skye and the work was undertaken by the Countess de Latour in the period immediately prior to the First World War. The description of the excavations was prepared by FT Macleod who was not actually present on the site, clearly not the ideal situation. The excavation demonstrated that the broch had an internal diameter of 31 feet, a main entrance in the west, with bar hole and guard chambers and a smaller, although probably contemporary entrance in the east (Fig. 262). Such a feature is feature is also noted at Dun a' Choin Dhuibh on West Loch Tarbet (Young 1964, 187). The main thrust of the excavation at Dun Iardhard appears to have been to establish the architectural features of the site with small finds of secondary importance, although these did include a unique terra cotta model, recovered from the lowest levels of the site (Curle 1932, 289) and which is traditionally described as being a corded bale of goods.

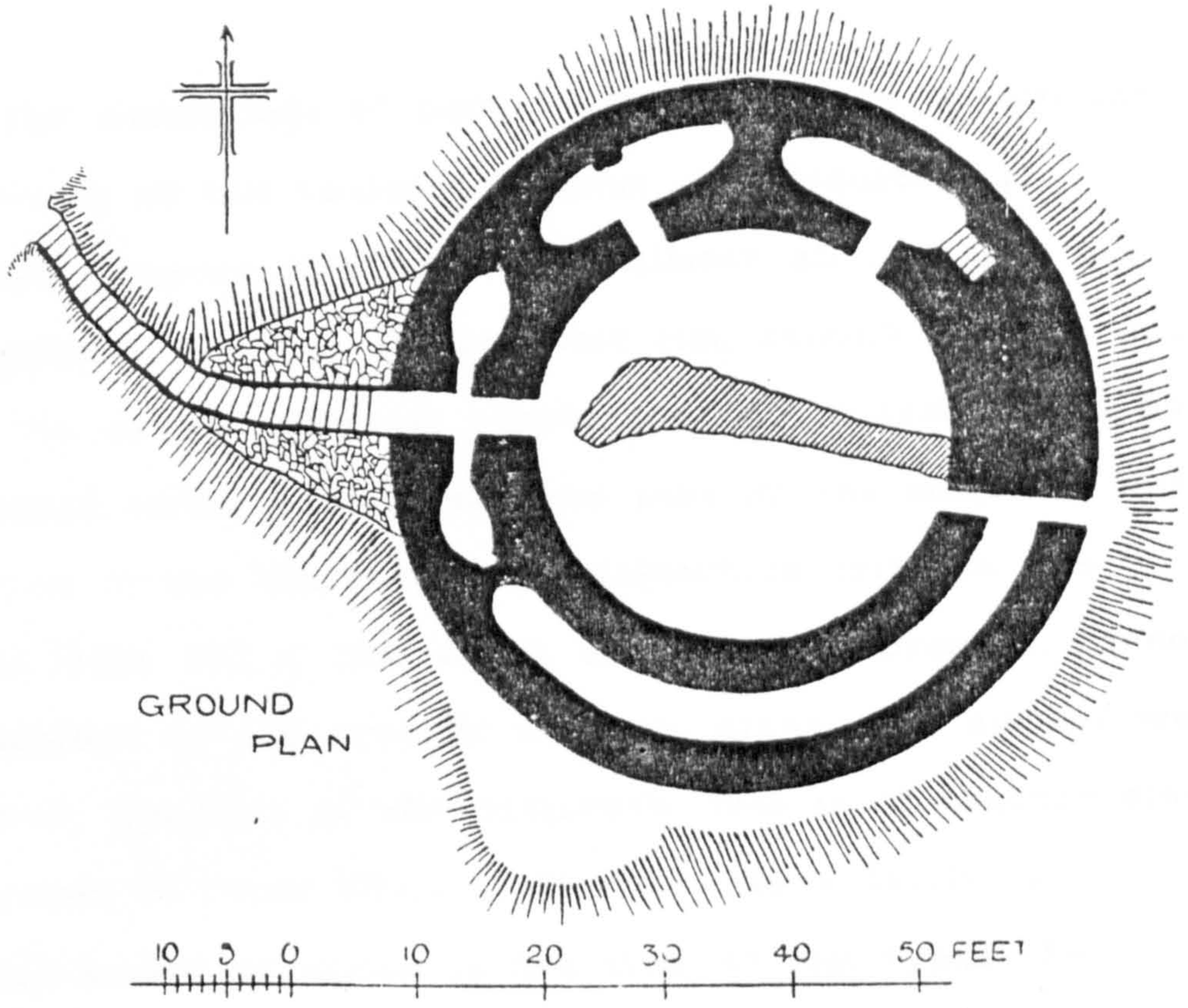


Fig. 262: Dun Iardhard site plan (after Macleod 1915).

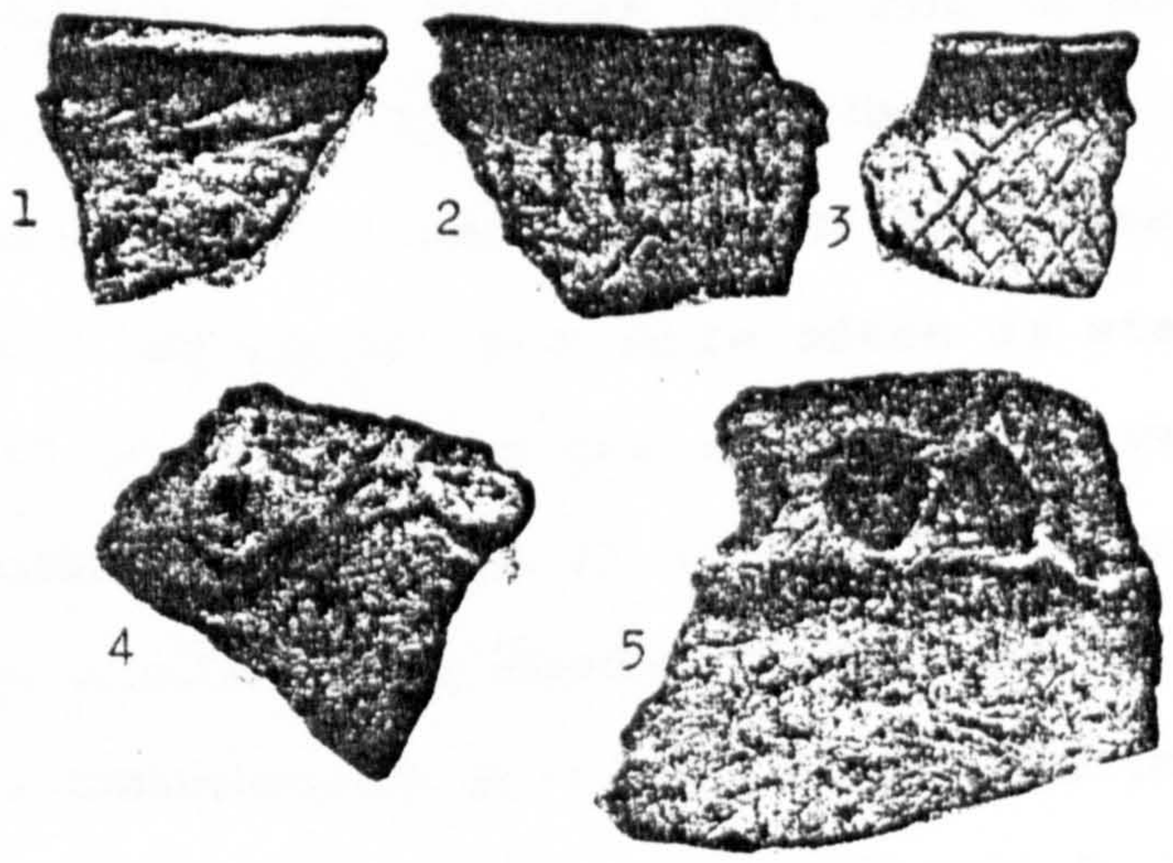


Fig. 263: Dun Iardhard pottery. Scale not given (after Macleod 1915).

The Pottery from Dun Iardhard.

The assemblage of pottery from the site within the collections of the National Museum of Antiquities of Scotland numbers only 56 sherds. Almost all of these are decorated or possess a diagnostic rim, raising the suspicion that the extant material represents only a fraction of the excavated material and that the rest of the material was rejected on the basis of these subjective criteria. The sherds (Figs. 263 & 264) which are extant, moreover, cannot be ascribed to any specific context, although a number were found at the foot of the staircase. This is of concern since the range of other small finds indicates a fairly large general period of usage of the site. Of rim types the majority are everted (eg nos 2-3, 10, 19 and 39), with out turned (eg nos 1 and 7) and plain rims (nos 9, 32 and 37) also being present. Decoration seems to occur irrespective of rim type, all the varieties have examples of stab or impressed decoration just beneath their rim. In some cases this decoration is finger tip impressed (eg nos 7 and 9) in others it consists of the impressions of some small undefined object (eg no 32), but more often as stab marks (eg nos 1-2, 40 and 42). Other non rim sherds have stab or finger tip impressions (eg nos 27 and 30-31), however, more common is the applied wavy cordon (eg nos 8, 13-14, 21, 23 and 43), which occasionally possesses finger tip impressions or vertical nicks on the cordon itself (eg nos 5, 18 and 34) and in 2 examples is unusually heavy and deeply finger tip

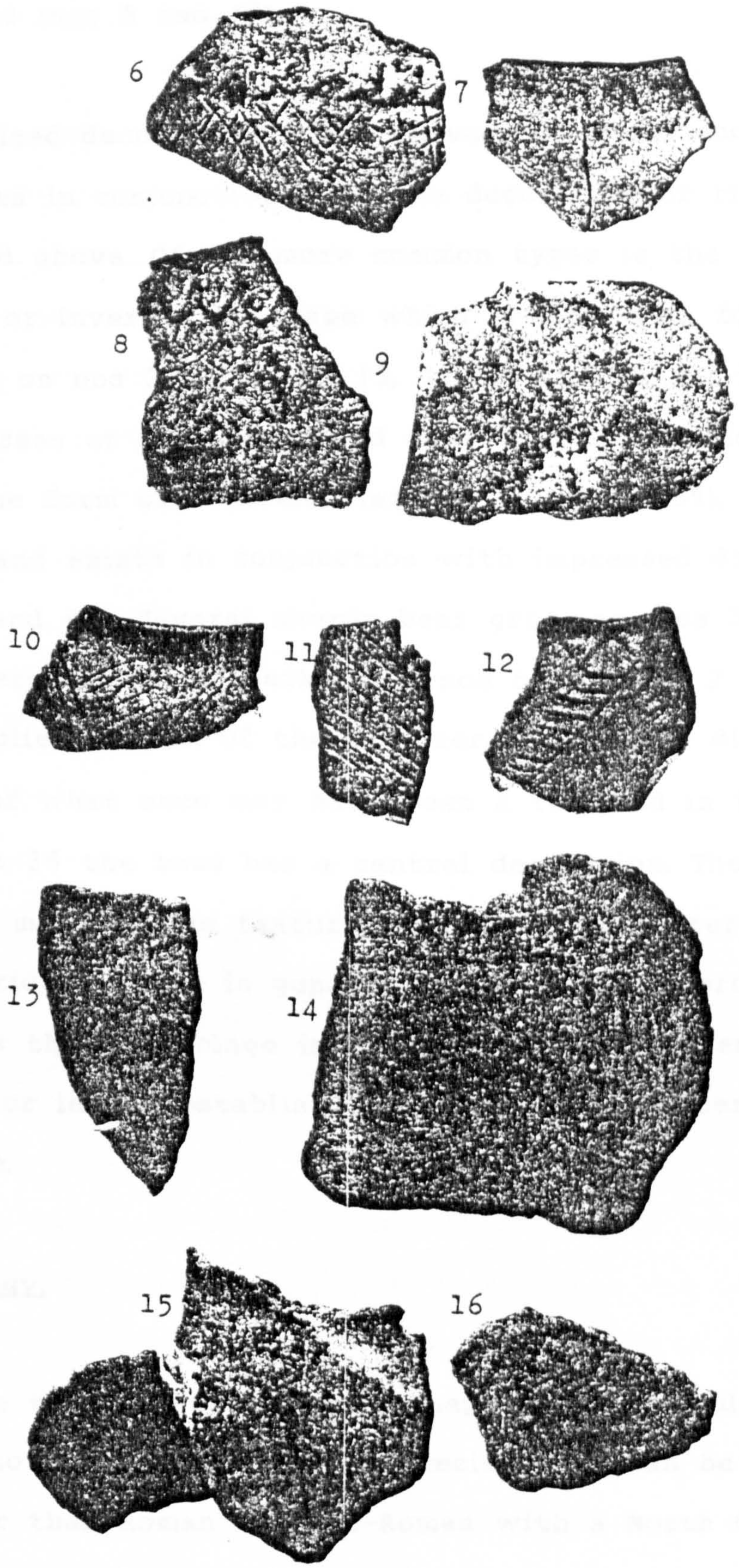


Fig. 264. Dun Iardhard pottery. Scale not given (after Macleod 1915).

impressed (nos 5 and 17).

Incised decoration occurs in varying forms and sometimes in conjunction with the decorative or rim types described above. Of the more common types is the incised chevron or inverted 'V' shape which is displayed, for example, on nos 2-3, 10, 12, 15, 19, 45 and 50. All these also possess or once possessed everted rims. Incision also takes the form of a lattice (eg nos 3, 11 and 39), ladder (no 22) and exists in conjunction with impressed dots (eg nos 44 and 48). Several sherds bear grooving (nos 37-38 and 56), others are grass marked (eg nos 51-53) and 2 sherds have applied bosses. Of these latter, sherd no 3 displays 2 bosses of what once may have been a row and in the case of sherd no 35 the boss has a central depression. The pottery displays many of the features which are characteristic of the Hebridean types in general, but without records of contexts the assemblage is of little value in attempting to clarify, or indeed establish, a Western Isles pottery sequence.

Chronology.

The terra cotta object, perhaps a model wool bale, is unique to the Hebrides and no precise date can be ascribed to other than Roman or post-Roman with a North German origin being suggested (Curle 1932, 290). Of greater potential value, however, are the range of beads most of which have

defined contexts, even if these are vague. A large number of amber beads which form a necklace, were recovered from beneath a slab in the entrance to one of the inter mural cells. Such beads have a long potential period of usage and no useful date can be given for them alone. They were, however, found in conjunction with a large translucent spheroid bead and 2 others which were in the form of a truncated cones, opaque and reddish brown in colour. Similar beads to these have been recovered from Anglo-Saxon graves (Macleod 1915, 65).

Of perhaps more relevance to the primary occupation of the broch are the other glass and vitreous paste beads. One of Mrs Guido's class 8, the small yellow annular type, was recovered from the ashes and clay in the centre of the broch court (Macleod 1915, fig 10, no 7). These beads are usually dated to the last 3 centuries BC or early first century AD (Guido 1978, 76). Of the other beads which were recovered 1 was of class 13 variety being fawn in colour and having a spiral pattern (Macleod 1915, fig 10, no 1). Such beads were probably copies of the Southern English Meare type and were produced into the first century AD and died out in usage late in the second century (Guido 1978, 85-87). A broadly similar date range is also advanced for the half bead of class 14 type which was recovered from the base of the secondary wall (Macleod 1915, fig 10, no 9). The remaining 2 glass beads from the site were spheroid in shape and of green translucent colour (Macleod 1915, fig 10, nos 3-4) and

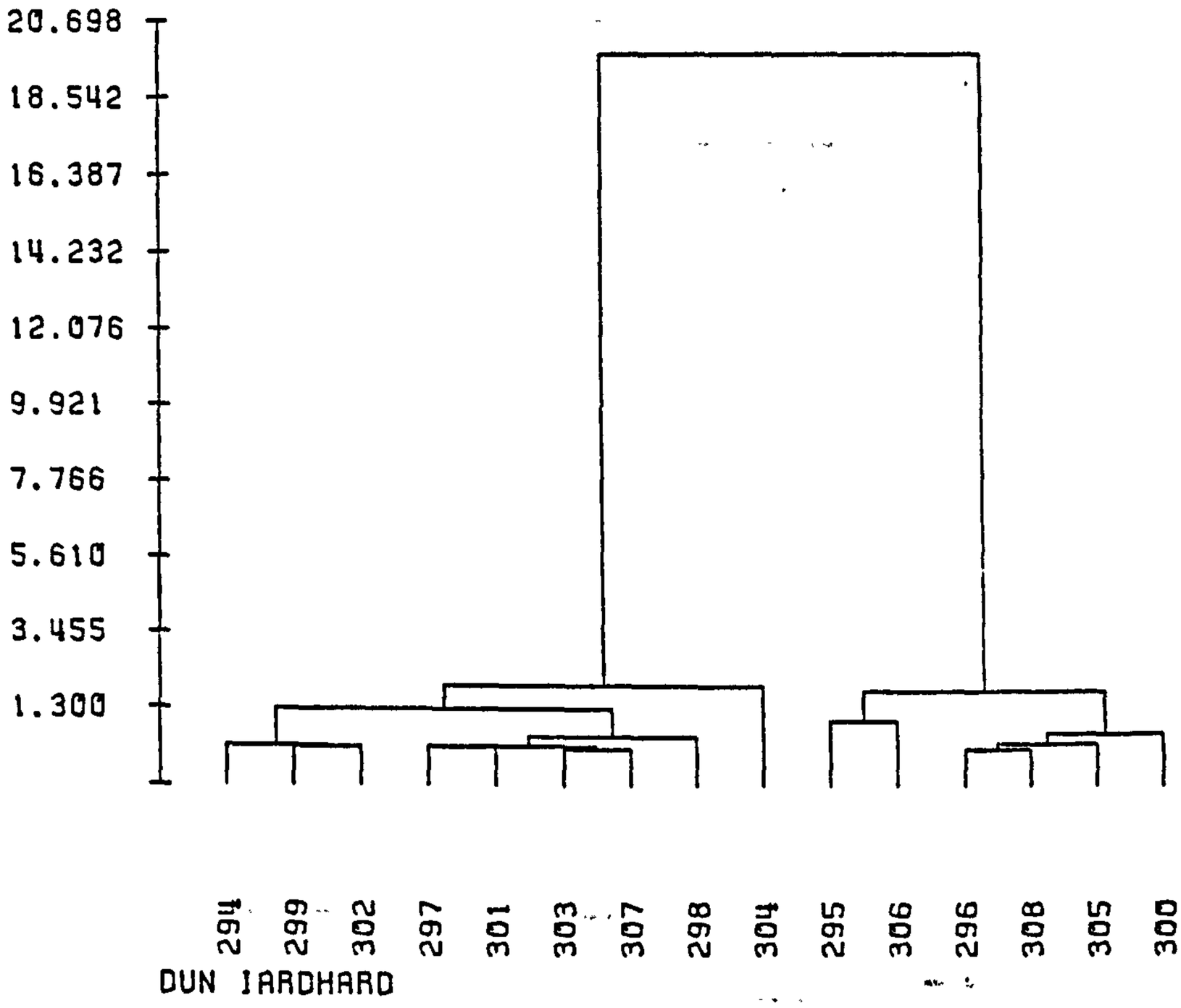


Fig. 265. Dendrogram of sampled sherds.

Dun Iardhard

Cluster One: NAA samples 294, 299, and 302.
Cluster Two: NAA samples 297, 301, 303, 307 and 298.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	25.9	17.3	23.8	23.4	1.2	36.2
Accept Null hypo.	Yes	Yes	Yes	Yes	No	Yes

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 266.

Dun Iardhard

Cluster One and Two: NAA samples 294, 299, 302, 297, 301, 303, 307, 298 and outlier 304.
Cluster Three: NAA samples 295, 306, 296, 308, 305 and 300.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	0.1	<0.0	0.2	0.1	<0.0	0.1
Accept Null hypo.	No	No	No	No	No	No

Null hypothesis: Cluster One, Cluster Two and outlier 304 come from the same population as Cluster Three.

Fig. 267.

Dun Iardhard: Cluster Number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
294	3	Unknown	everted	incised lattice pattern and chrevron beneath the rim
299	7	Unknown	slightly out turned	finger tip impressions in a row beneath the rim
302	1	Unknown	out turning	row of oblong marks along the rim, draw marks beneath

Fig. 268.

Dun Iardhard: Cluster Number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
297	5	Unknown	-------	heavy applied cordon marked with finger tip impress., grass marks
301	6	Unknown	-------	pinched up cordon, hatched lattice beneath
303	10	Unknown	everted	incised lines forming chevrons below the rim
307	15	Unknown	everted now gone	incised lines forming large 'V' shapes
298	9	Unknown	rounded	finger tip impress. below rim

Fig. 269.

Dun Iardhard: Outlier Number 304

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
304	12	Unknown	everted now gone	row of small incised chevrons other short incised lines

Fig. 270.

Dun Iardhard: Cluster 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
295	4	Unknown	-------	Applied bosses in a row
306	14	Unknown	-------	wavy cordon
296	2	Unknown	everted	stab marks below the rim with incised chevrons beneath
308	16	Unknown	-------	wavy cordon with incised lines
305	13	Unknown	-------	thin wavy cordon, brushed
300	8	Unknown	-------	applied wavy cordon, grass marks

Fig. 271.

although they were considered to be superficially similar to the bead from Clettraval, N Uist (Scott 1948, 66), they are not specifically discussed by Mrs Guido, although their nature would seem to suggest a 3rd century AD or later date (Guido 1978, 70). One was recovered at the floor level within the court, the other was at a high level in the main entrance passage. Thus from the evidence of the beads it may be concluded that at least 2 periods of occupation may be deduced, the earlier in the late 1st century BC to the 2nd century AD, the later of Dark Age date. Given the lack of contexts for the pottery a span covering both these date ranges for its usage is all that may be suggested.

NAA results.

Fifteen sherds from Dun Iardhard were sampled by NAA and the clusters in Fig. 265 were obtained. Figs. 266-267 indicate that there were 3 significant clusters and 1 outlier with the characteristics of these groupings being illustrated in Figs. 268-271. No contexts are known, other than the sherds came from the broch itself, and in terms of form and decoration there are no identifiable patterns in the groupings.

The site of Dun Beag, Struan.

The site has long been famed on Skye as one of the better preserved later prehistoric structures. It was visited by Pennant in 1769 who estimated its height at 18 feet, and by

Johnson and Boswell in 1773 who measured it as 9 feet high. The latters' patronizing view of Scotland so enraged Donald McNicol, the Church of Scotland minister at Lismore, that he published a response pointing out their many inaccuracies, of which he considered their description of Dun Beag was just one example (McNicol 1817, 346-348). in fact his own description was also somewhat lacking (Callander 1921, 118). The broch is situated on a small rocky knoll above Loch Beag, an offshoot of Loch Bracadale, at a height of just over 70 metres OD. It was excavated by the Countess de Latour and was reported by Dr Callander, who fortunately was present during the excavation (Callander 1921). Architectural elements of the broch were recorded in detail, giving an interior diameter of 35 feet with walls surviving to between 10-12 feet in height (Fig. 272). Several internal features were also noted, with the presence of layers of red peat ash, drains and paving being recorded, although many of these were thought to be of later date as was the bulk of the pottery associated with them.

<u>The pottery from Dun Beag</u>.

The site report makes it very clear that much mixing of the varying levels within the broch had occurred prior to excavation, indeed Dr Callander was at a loss as to how to explain the finding of modern beads in a supposedly sealed context close to the base of the wall (Callander 1921, 130-131). It was also noted that much of the pottery which

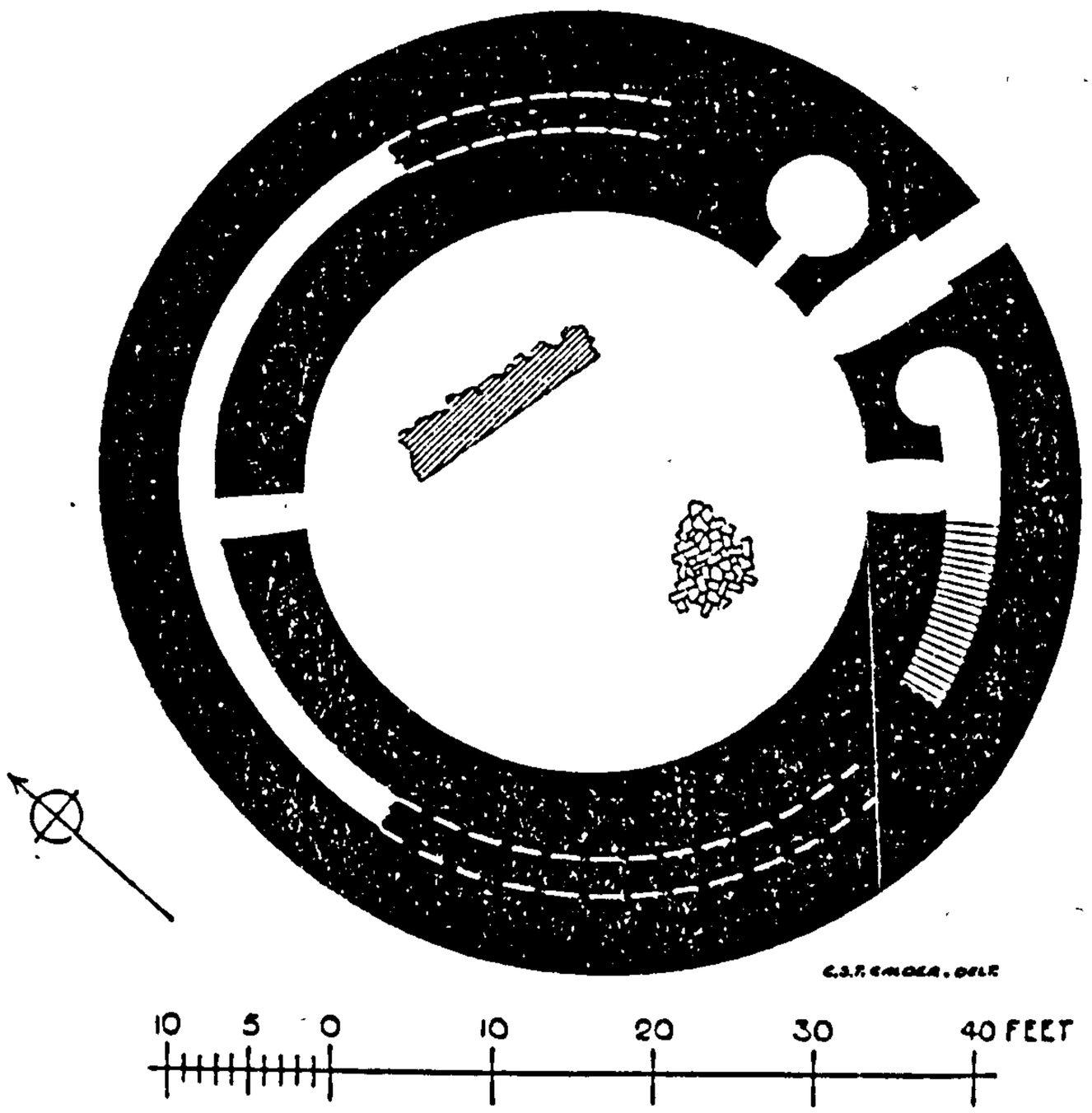


Fig. 272: Dun Beag site plan (after Callander 1921).

was recovered consisted of sherds from modern craggans, great care therefore, ought to be exercised in attributing date ranges or defining stylistic types from this assemblage. In total 90 sherds from Dun Beag are contained within the collections of the National Museum of Antiquities of Scotland, unfortunately of these only the 2 crucibles (nos 1-2) are illustrated in the site report. Of rim types, everted are preponderate (eg nos 14-18), with only 1 vertical rim (no 4) and 2 plain rounded rims (nos 19 and 43). There are a total of 14 base sherds or bases, no 8 has its bottom finger tip marked and no 9 has a projecting foot.

Decoration consists of the usual types which have occurred on many Hebridean sites. Applied wavy cordons exist on nos 39 and 66-69, cordons with transverse nicks on nos 58-59 and pinched up cordons on nos 10-11. Incised lines appear on several sherds (eg nos 36, 72 and 80) but grooving is more common with a pattern of chevrons being visible on no 57, a 'V' on no 27 and closely spaced grooved lines on no 6. Of the remainder of the sherds, 4 display applied bosses with that on no 7 having a central dimple and being not dissimilar to a sherd from Dun Iardhard.

Chronology.

A very wide variety of small finds were recovered from Dun Beag, ranging from Roman material to 18th century coins, illustrating the several periods of usage which the site

underwent. The earliest datable artefactual material consists of a piece of Roman glassware and several small glass beads. The Roman glass is part of an armlet of translucent green glass, coated on the exterior with with a layer of white enamel and inlaid with 3 narrow bands of yellow vitreous paste in a ladder pattern (Callander 1921, fig 9, no 8). It is of Kilbride-Jones' type 1, of which 13 were found at Traprain Law and for which he suggested a late 1st or 2nd century AD date (Kilbride-Jones 1938, 371). It seems that this type is restricted in its distribution to Scotland and it is known that at least some of the type were being locally manufactured at Traprain Law from pieces of reused Roman glassware (Stevenson 1956, 216).

A number of glass beads were also recovered from Dun Beag, those that are considered by Mrs Guido are all of Roman type, the others are Dark Age. Of the former, 2 are blue in colour, polygonal in shape and of uncertain date although the late Roman period seems most likely (Guido 1978, 97). Another of the beads is small, black and globular of group 7 type not common in Britain and again a late Roman date seems applicable (Guido 1978, 70-71). The other black bead from the site is oblong or oval in shape, and of a class more commonly fond in a blue colour. It is considered to be most probably of post Roman date (Ibid, 224), as were the remaining beads from the broch. On the basis of the small find evidence a date for the occupation of Dun Beag can be advanced from the Roman or late Roman period with

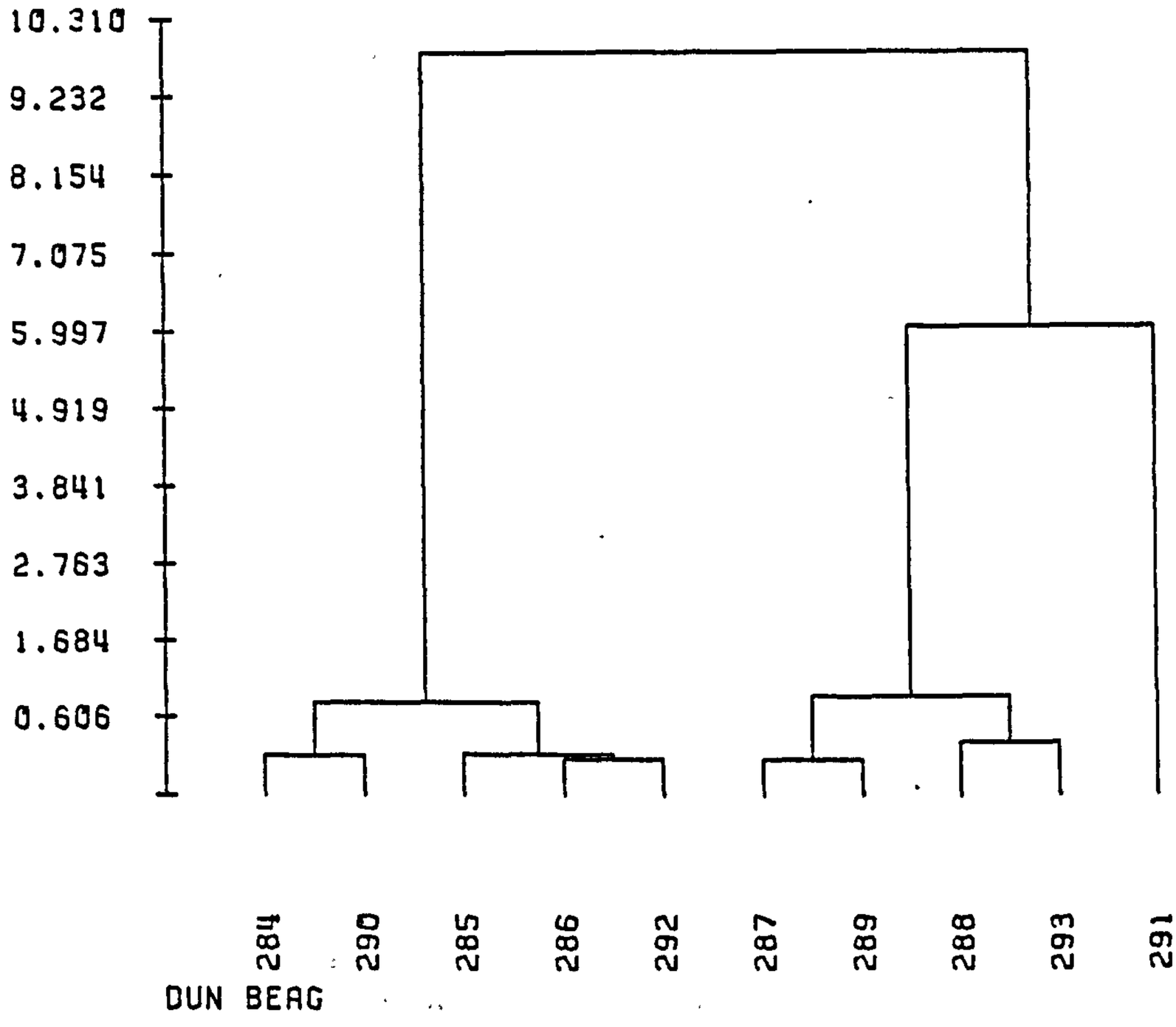


Fig. 273: Dendrogram of the sampled sherds.

Dun Beag

Cluster One: NAA samples 284 and 290.
Cluster Two: NAA samples 285, 286, 292.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	36.7	35.9	5.6	4.0	12.9	2.0
Accept Null hypo.	Yes	Yes	Yes	No	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 274.

Dun Beag

Cluster One and Cluster Two: NAA samples 284, 290, 285, 286 and 292.
Cluster Three: NAA samples 287, 289, 288, 293 and outlier 291

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	1.3	6.5	4.9	<0.0	11.7	0.01
Accept Null hypo.	No	Yes	No	No	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population as Cluster Three.

Fig. 275.

Dun Beag: Cluster Number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
284	26	Unknown	-------	applied boss
290	1	Unknown	-------	small metal working crucible

Fig. 276.

Dun Beag: Cluster Number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
285	21	Unknown	everted	----------
286	57	Unknown	-------	cordon in a rope effect with faint grooved chevrons beneath
292	7	Unknown	-------	applied boss with a central dimple

Fig. 277.

Dun Beag: Cluster Number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
287	56	Unknown	everted	grooved chevrons beneath the rim
289	36	Unknown	-------	incised lines
288	53	Unknown	everted	----------
293	8	Unknown	-------	finger tip impressed base

Fig. 278.

Dun Beag: Outlier Number 291

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
291	2	Unknown	-------	small metal working crucible

Fig. 279.

sporadic usage into the 18th century.

NAA results.

Ten sherds were analysed from the Dun Beag collections in the National Museum. The clusters are shown in Fig. 273, of which 3 are significant and 1 is an outlier (Figs. 274-275) and all are described in summary form in Figs. 276-279. As with Dun Iardhard the contexts from which the sherds were recovered are not known, although it may be of note that the outlier is a small metalworking crucible. As discussed in chapter 7, residues on crucibles and moulds do not necessarily penetrate the fabric of the sherd, but rather affect those areas in contact with the metal (Barnes 1984, 40). This may provide another example of metalworking equipment deriving from different clay sources to the more mundane pottery, although it has to be stated that NAA sample 290 was also a crucible and it fell into cluster 1 from Dun Beag and so the issue is not clearly resolved.

The site of Dun Ardtreck.

Dun Ardtreck is one of the galleried duns on Skye and is situated on a stack of rock which forms a sheer precipice over 50 feet high on the seaward side. It was included in the Royal Commission survey of the Western Isles, when it was noted that the walls only protected two thirds of the circumference of the circle, as the sheer seaward side was

unwalled with no traces even of a parapet (RCAHMS 1928, no 484). The site was excavated by Dr MacKie during 1964 and 1965 (Discovery & Excavation in Scotland 1964 and 1965) as part of his research into the nature of 'semibrochs' which he believed were broch precursers, and that they developed in the west, most notably on Skye (MacKie 1965, 125-126). He classified Dun Ardtreck as a 'D-shaped semibroch', believing that the unwalled side was a deliberate feature of such structures and that other examples included Dun Grugaig near Glenelg and Dun an Ruigh Ruaidh, Loch Broom (MacKie 1980, 32-33). It has been suggested that the similarity in D-shaped plan of some of the structures may be as much due to collapse of wall material over the cliffs as it is to deliberate building policy (Harding 1984, 211), indeed it may be wondered if this may not be the explanation for the plan shape of nearly all such structures. That Dun Ardtreck might have been built with its seaward, and also prevailing windward side left exposed, instinctively seems improbable.

It is unfortunate that the full excavation report is as yet unpublished, however, several summaries have been produced, as have figures and illustrations for the final report, and I am indebted to Dr MacKie for his generosity in providing me with these. The central part of Dun Ardtreck was constructed on top of the rocky knoll and was surrounded by an outer defensive work. The galleried walls of the dun itself were constructed on a massive rubble platform and the site possessed a paved entrance, door checks, a bar hole and

a guard cell. At its best preserved the galleried wall proper only survived to a height of 3 feet, and although no intermural stairway was discovered, the excavator believed that the site had originally been at least 10 feet higher with galleried walls of a type found in many brochs (MacKie 1965b, 277). In a later phase of occupation much of the walling was probably demolished and the site was converted to a dwelling. The majority of the finds, including fragments of Roman pottery of 2nd century AD date or later, were recovered from this phase of occupation. The other small finds consisted largely of Hebridean pottery, several glass beads and assorted pieces of metalwork, including an iron axehead and an iron door handle.

<u>The pottery from Dun Ardtreck: Phase 1 & 2.</u>

It is unfortunate that all the pottery from the site could not be found, there were for example, several sherds which are known to have existed from the illustrations but which could not be located. Only 1 piece of pottery was recovered from a phase 1 context, from inside the rubble platform of the dun interior. The sherd (no 1) is probably part of a base, is thick and has a rough impression of a thumb, otherwise it is undiagnostic. Rather more sherds (Fig. 283), however, were recovered from phase 2 contexts of the site, most can be atributed only to the dun interior, although several are known to have come from specific trenches (Fig. 280). Of rim types from the interior there

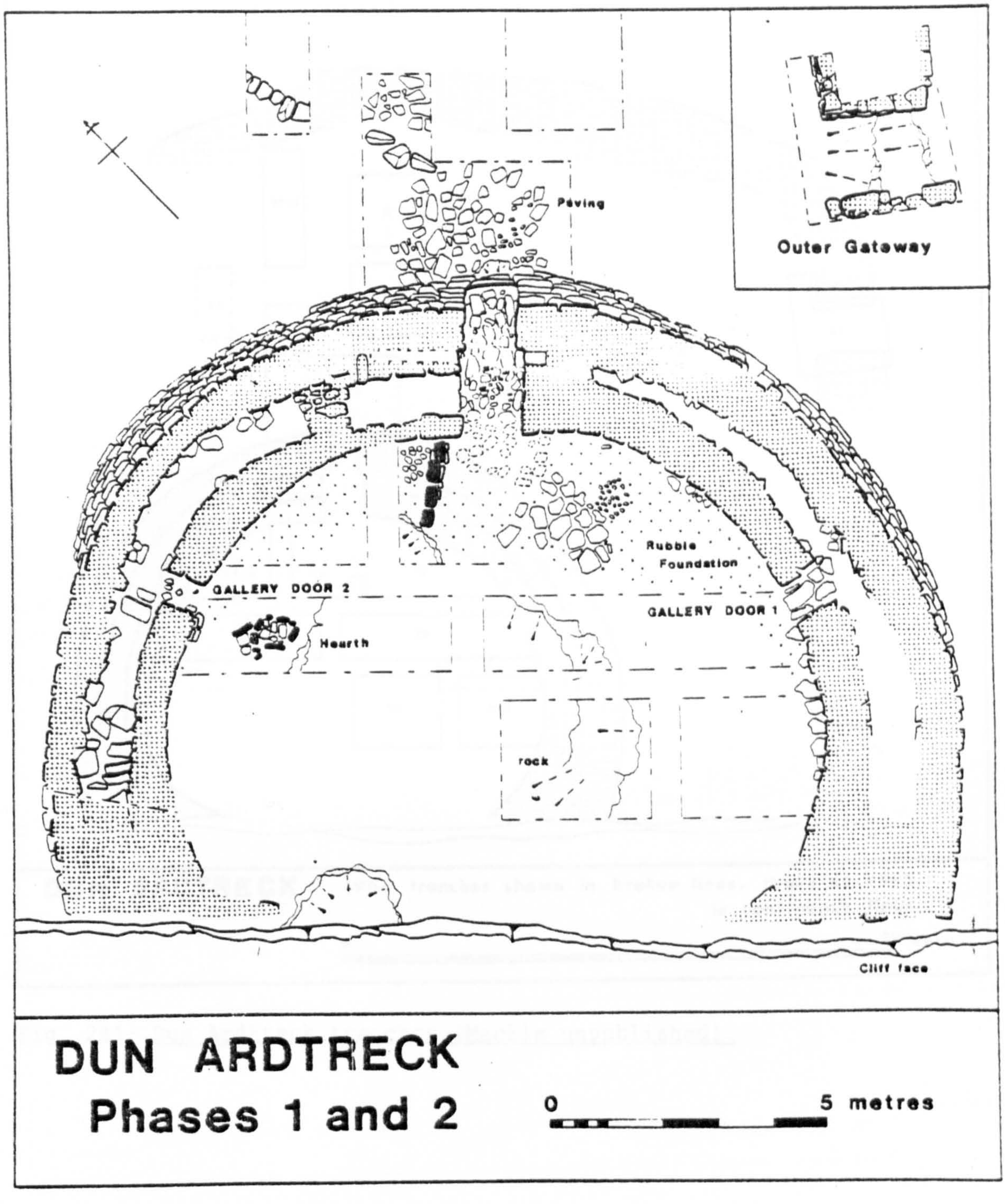


Fig. 280: Dun Ardtreck site plan phases 1 and 2 (Mackie unpublished).

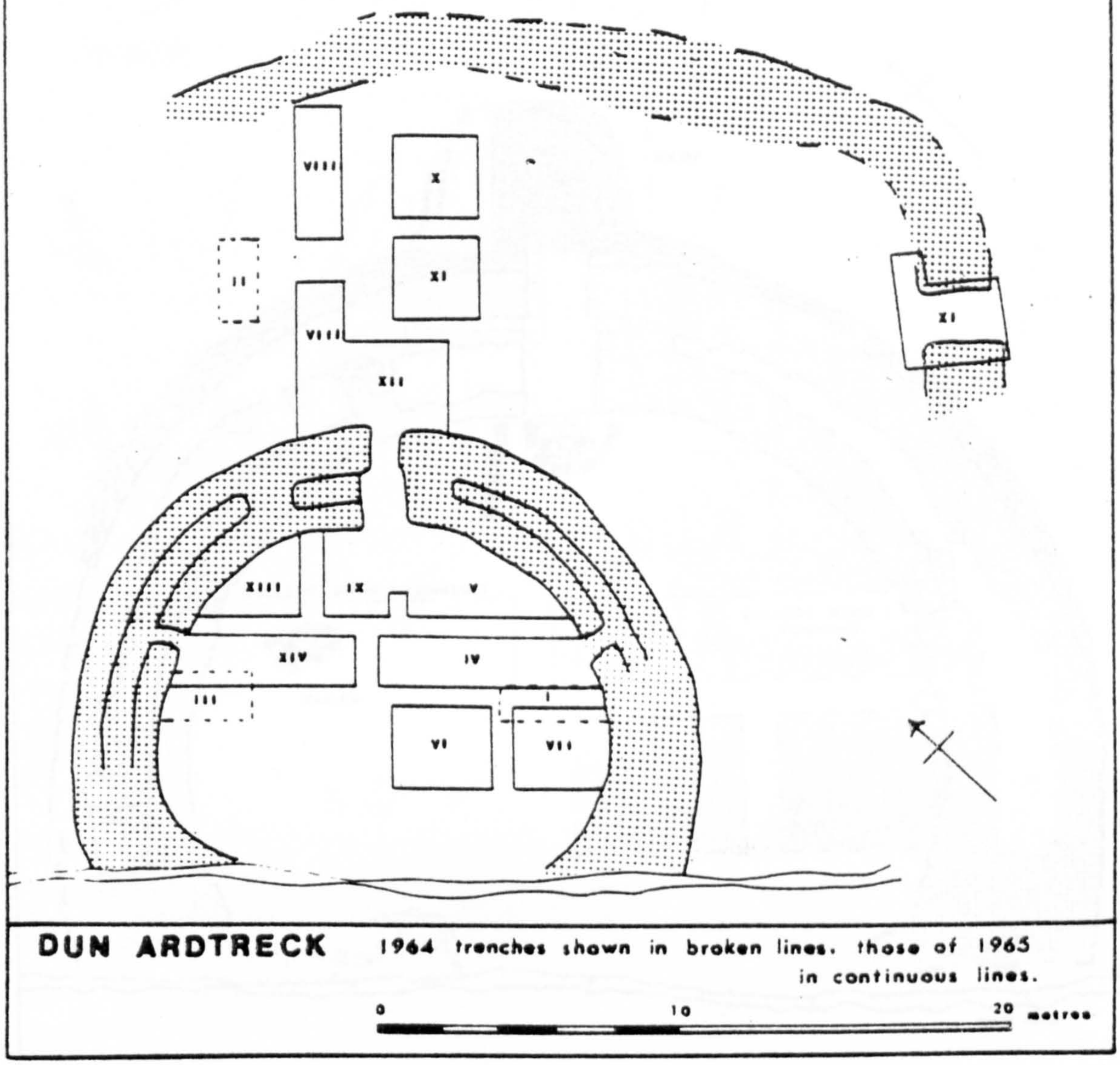


Fig. 281: Dun Ardtreck trenches (Mackie unpublished).

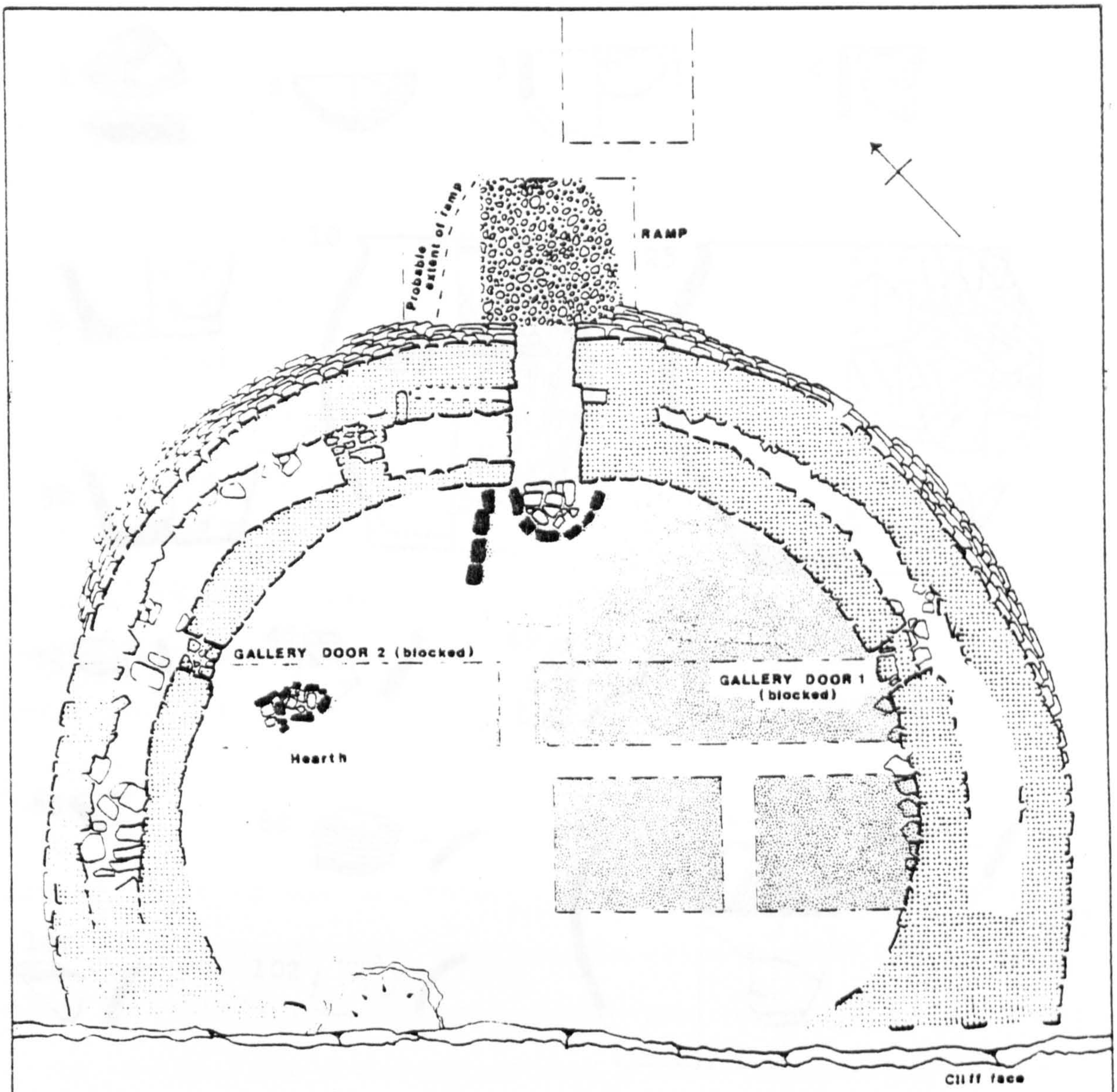


Fig. 282: Dun Ardtreck site plan phase 3 (Mackie unpublished).

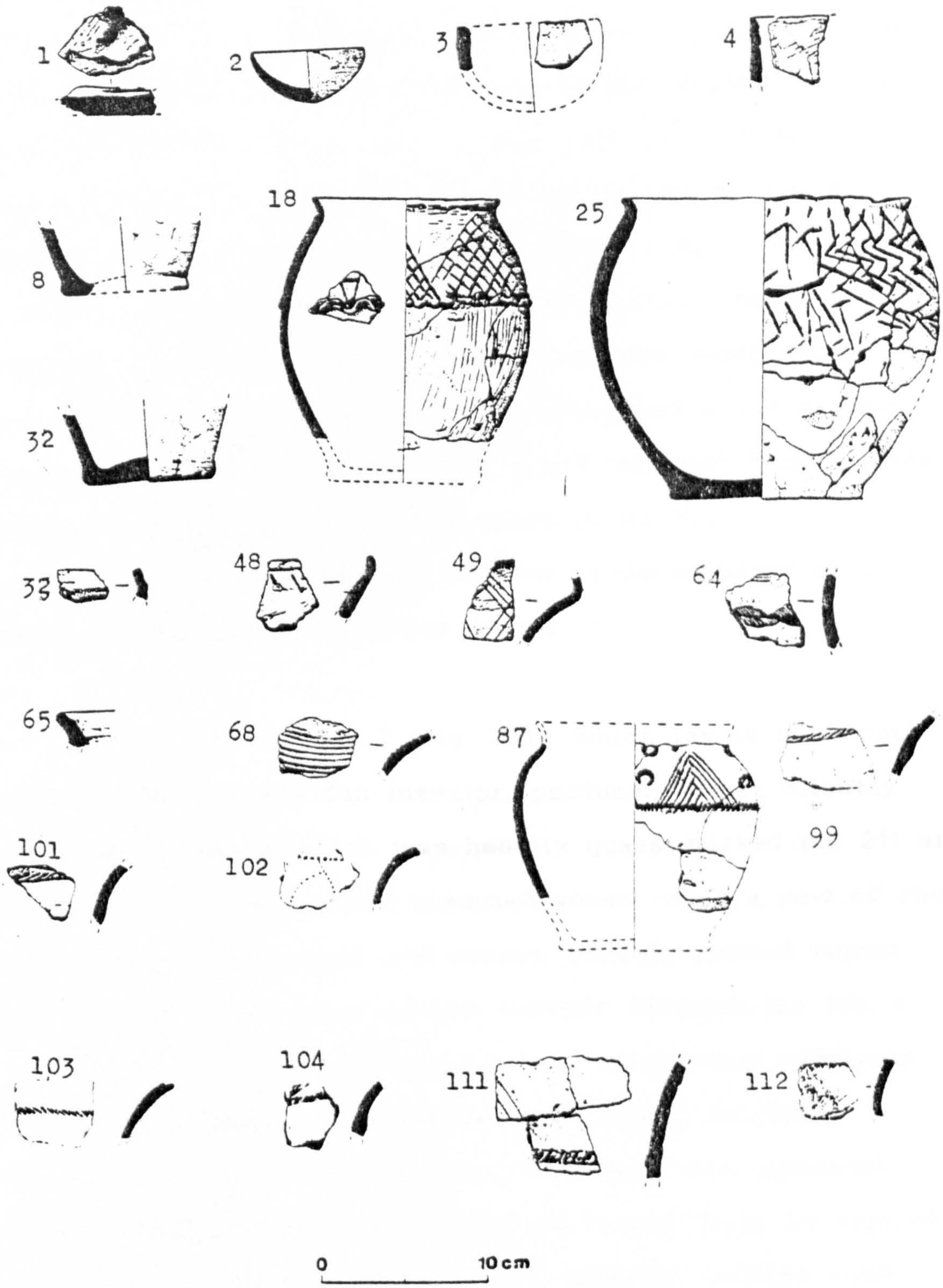


Fig. 283: Dun Ardtreck pottery (Mackie unpublished).

are several everted rims (eg nos 7, 11, 15-16 and 22-24), of which no 33 has slight fluting on the rim inside edge. Other rims include no 11 with an everted lip, no 29 which has a thin rim and no 4 which is vertical. Decoration includes wavy applied cordon on no 30, grooves on nos 19 and 27, incised chevron with other incised lines on no 38 and short incised strokes on no 40. Of the base sherds, 2 were slightly footed (nos 8 and 32) and 1 unusual sherd, which was probably a base, displayed 3 round impressions on the base interior. Unfortunately this sherd was not found in the pottery collection but is illustrated in MacKie's preliminary proofs. The interior also produced parts of 2 small metal working crucibles (nos 2-3).

Trench IV in phase 2 (Fig. 281), which lay in the south eastern part of the dun interior, produced a flat slightly everted rim sherd which was heavily grass marked.(no 21) and many parts of an everted rimmmed vessel with a row of short stabs in the neck angle and coarse, crudely incised zigzag lines on the upper part of the vessel's exterior (no 25). 4 undiagnostic wall sherds came from a black level overlying the entrance passage paving (no 225). Trench VII, lying against the interior of the dun's southern wall produced several large parts of a everted rim vessel with an applied wavy cordon and displaying incised chevrons infilled with lattice hatching above (no 18). Other sherds were recovered from the blocking of the dun's mural galleries doorways, dated by the excavator to the end of phase 2. These include

1 piece with an unusual decoration of a single incised line with leaf shaped half ovals infilled with short strokes abutted onto it (no 64). The remainder of the small numbers of sherds were from walls or bases.

Phase 2 or 3.

A number of sherds are from contexts which belong to either phase 2 or phase 3. The packing of secondary steps at the dun produced a number of sherds, including a plain rounded rim (no 45), an everted rim (no 47), an out turning rim with short slanting strokes beneath (no 48) and an everted rim with triple inter crossing incised lines below (no 49). The dun interior contained a plain rim (no 43) and a sherd with faint brush marks (no 44). Sherds of greater significance, however, came from the rubble core of the body of the ramp at the dun entrance. These were parts of Roman coarse ware and Samian type vessels which were considered by the excavator to date this phase of the site to not earlier than the 2nd century AD (MacKie 1965b, 277). Sherds from similar vessels were recovered from Dun Mor Vaul, Tiree and were all dated to the Antonine period (MacKie 1974, 155).

Phase 3.

The great majority of the sherds from Dun Ardtreck derived, however, from phase 3 contexts. These included trenches IV, V, the baulk between IV and V, the baulk

between V and IX and the dun interior general context. Trench IV in the NW part of the dun contained 8 sherds or parts of vessels, of which 4 were rim sherds and all were everted (nos 78, 87, 184 and 187). No 87 was most of a reconstructed vessel which had a simulated cordon formed by a horizontal incised line with short strokes coming off it. In addition it bore incised chevrons between the simulated cordon and the everted rim with inbetween the chevrons the impressions of a bronze ring headed pin. No 84 had an applied cordon with deep slashes upon it and several grooves above, no 68 had horizontal rilling on the exterior, not dissimilar to a sherd from A Cheardach Mhor, S Uist (Young and Richardson 1960, fig 10, no 58) and to several from Dun Mor Vaul, Tiree (MacKie 1974, fig 18, nos 372-374). None of the sherds from trench V (nos 98-104 and 109-115), in the dun interior just SE of the entrance, preserved part of a rim or base profile. Applied wavy cordons existed on nos 98, 109 and 114-115, rows of transverse nicks giving a cordon effect on nos 99-101 and 103 and a slashed cordon with 2 thin grooving lines above on no 111. Triple grooves were preserved on no 110, no 113 had the appearance of a burnished exterior and no 102 was unusual in having 3 rows of dots, 2 of which formed a chevron and the other a straight horizontal line. Sherd no 140 had incised lines which gave a hatching effect. The baulk between trenches IV and V in the SE of the dun contained 2 sherds, 1 with an applied wavy cordon (no 169) the other with an everted rim and finger tip impressions beneath (no 170). The baulk

between trenches V and IX produced 1 sherd with a shiny exterior, perhaps a slip (no 110), another had part of an incised chevron and an everted rim (no 212) and the remainder bore applied wavy cordons (nos 211, 215 and 217).

The great majority of the rims from the general phase 3 context were everted (eg nos 93-94 and 165-168), although 1 had an external projection (no 173), 2 bore internal fluting (no 65 and 130), a very few were plain and rounded (eg no 127) and 1 was rolled and everted (Fig. 284), possibly a piece of Dark Age 'E' ware (no 148). Decoration on many consisted of wavy applied cordons (eg nos 69, 116, 134, 139 and 222) and in 1 case of double applied cordons (no 196). A number of the sherds with applied cordons also bore triple arching grooved lines (eg nos 146 and 149) in the style of 'Clettraval' ware whilst other cordons were finger pinched (eg nos 204-205). Several had incised lines in a variety of patterns (eg nos 152, 155, 181 and 208) and 1 sherd had internal horizontal rilling (no 189). Of the base sherds from this context several were footed (nos 83, 92, 122, 124 and 220).

Phase 4.

A total of 83 sherds were recovered from contexts considered to belong to phase 4 of the site's usage (nos 53-63). Of the rims, 1 was out turned (no 60) and most of the others were everted (eg nos 56-58). Sherd no 62 from

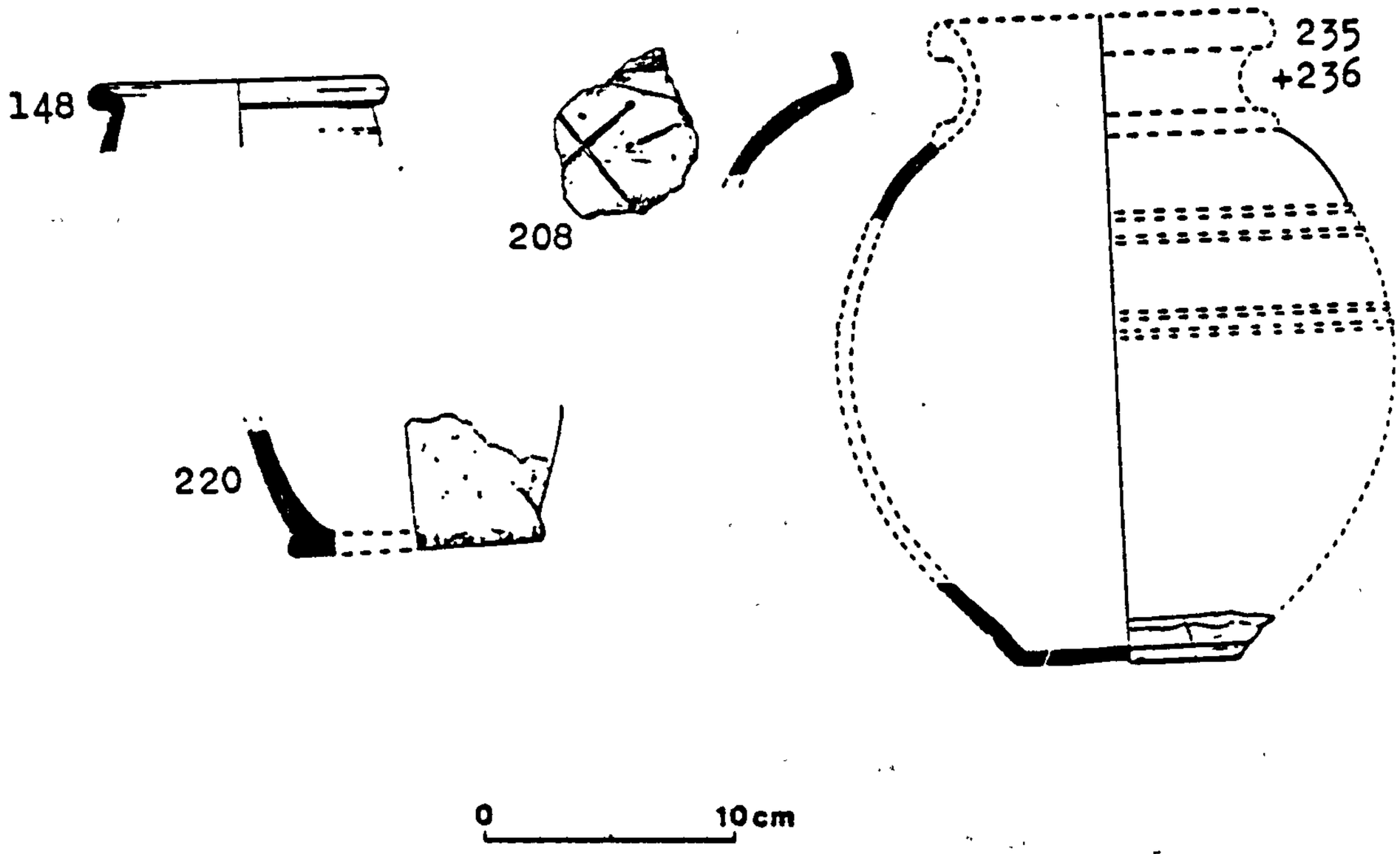


Fig. 284: Dun Ardtreck pottery (Mackie unpublished).

trench XIII to the NW of the dun interior, and perhaps many of the others from different contexts, were most probably not of Later Prehistoric date and none had formal decoration.

Chronology.

From the foregoing discussion of the pottery it can be seen that the excavator considered that 4 phases could be outlined on the site. Phase 1, in addition to the single sherd, also produced several small glass beads. Of these, 2 were of the small yellow, annular class 8 variety with production dated from the 3rd century BC to the mid 1st century AD (Guido 1978, 76). Other small beads from this context were of a blue glass and of group 7 type with a wide potential chronological range from 1st/2nd century BC up to the late, and perhaps post Roman period (Ibid, 70). A C-14 sample was obtained from charcoal scraps in the rubble foundation (Discovery & Excavation in Scotland 1967, 29) and its significance will be discussed below.

At the end of phase 2 the dun was violently destroyed by fire (MacKie 1969b, 70-71) and further glass beads, perhaps part of a necklace, were recovered from the destruction levels and from early phase 3 contexts. These included several beads of the same class 8 type discussed above, 2 small class 14 beads usually dated to the 1st/2nd century AD (Guido 1978, 88) and an unusual opaque terracotta

coloured small biconical bead of Roman type and uncertain date. Other finds from phase 2 included a fine axe-hammer made of iron and a unique door handle (MacKie 1979, 299). This phase may be reasonably dated to not earlier than the 2nd century AD by the Roman pottery, although the dangers of using such material are acknowledged (Clarke 1971, 25). The later phases on the site seem to have been of a more domestic nature than the early dun occupation with habitation occurring outside the central demolished area, although more details of this will not emerge until fuller publication of the site. At the very end of the site's usage in phase 4, a sherd with a rolled, out turned rim and of an unusual fabric was recovered, it may be of Dark Age 'E' ware fabric but there are some similarities with Roman vessels and the matter is as yet unresolved.

The Dun Ardtreck radiocarbon date.

The sample for C^{14} dating (GX-1120) was obtained from charcoal in the rubble foundations of the site and was deposited prior to the erection of the dun. The date which was derived from this sample was 2005 $\pm$ 105 bc (MacKie 1969a, table 1) and which although calibrated by MacKie to between 325 BC and AD 95 (MacKie 1969c, 56), has been used to support a date of the 1st century BC/AD for the date of the site's construction and of the glass beads contained within it (Guido 1978, 88 & 172). Calibration by the curve produced by Klein et al (1982), however, gives a range of

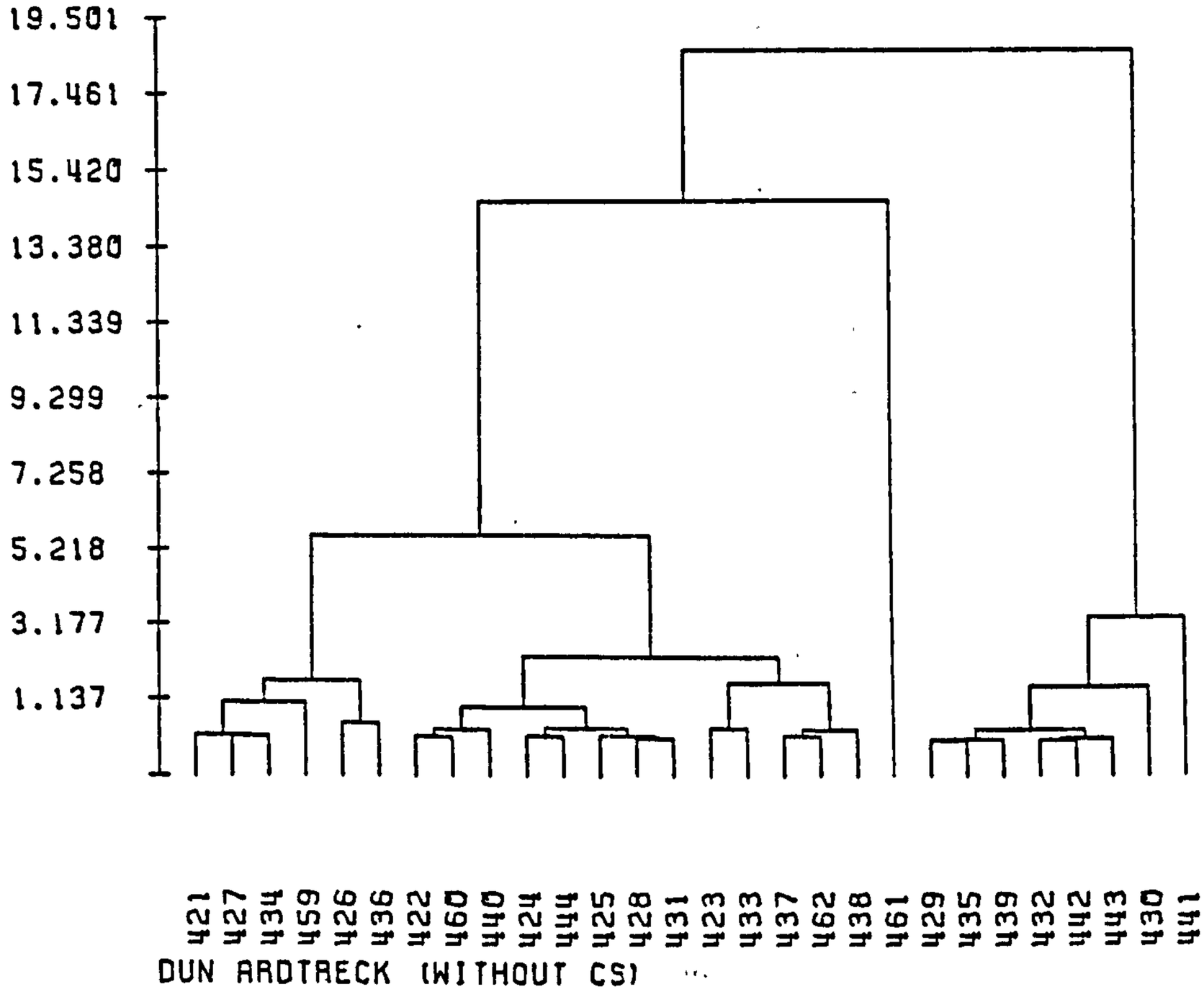


Fig. 285: Dendrogram of sampled sherds.

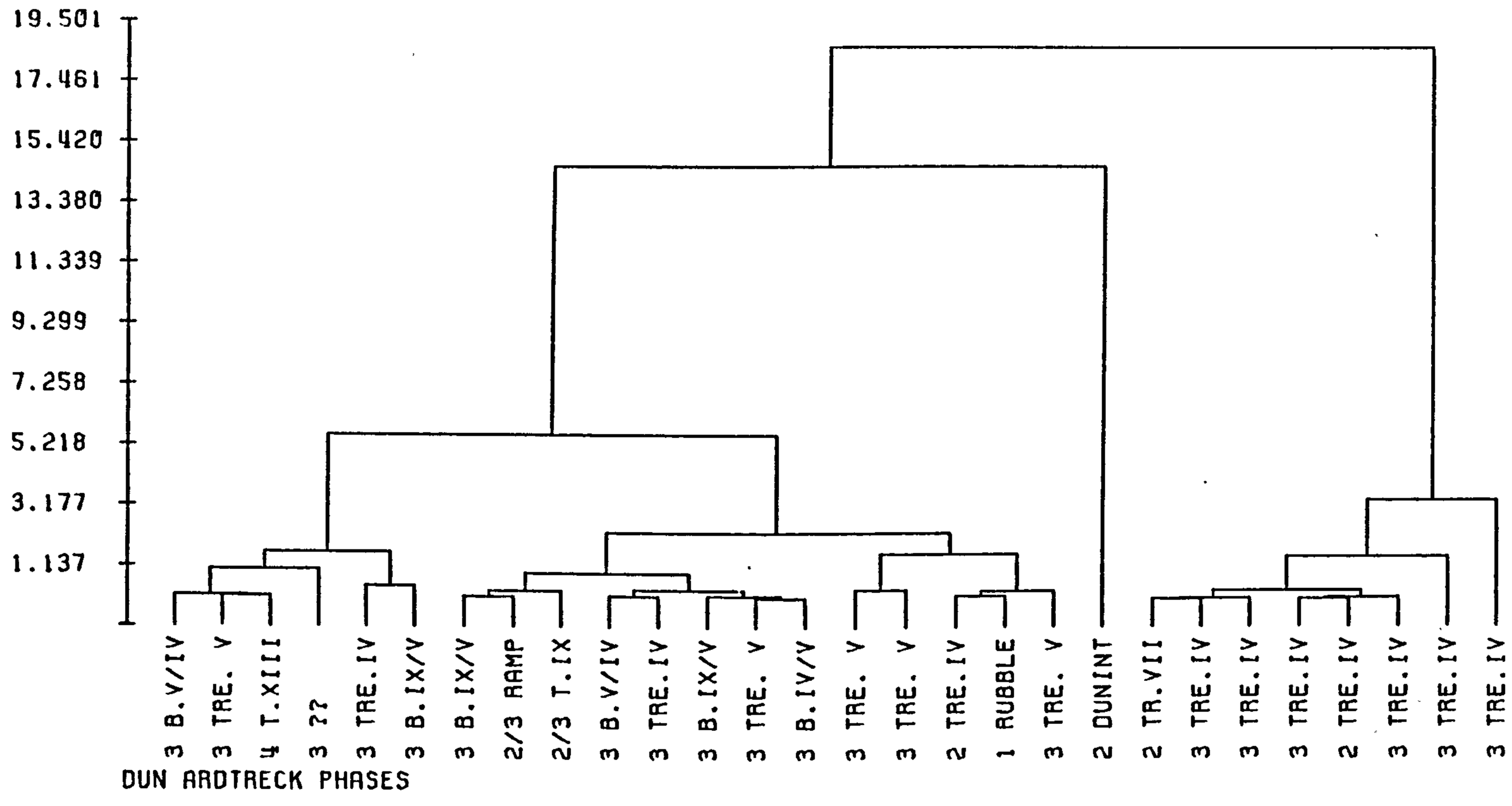


Fig. 286: Dendrogram of sampled sherds, labelled by phase and context.

The Calibration of the C-14 Date From Dun Ardtreck, Skye.

Geochron Lab. Sample	Yrs. bp and ad (Libby)	Calibrated by MacKie (1969c)	Calibration on Klein et al Curve (1982)
GX-1120	2005 ± 105	325 BC-AD 95	370 BC-AD 220

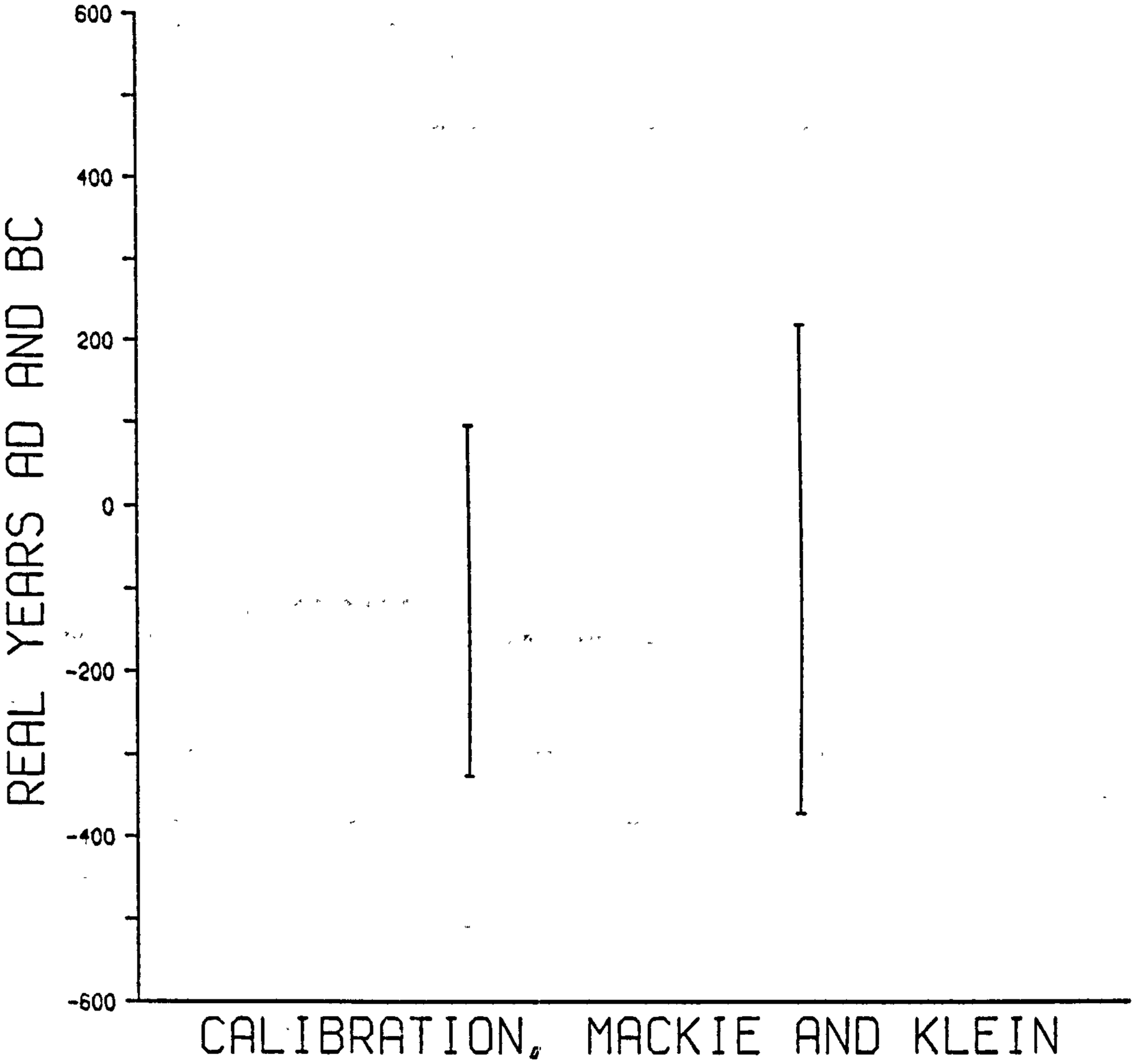


Fig. 287.

Dun Ardtreck

Cluster One: NAA samples 421, 427, 434 and 459.
Cluster Two: NAA samples 426 and 436.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	29.5	20.3	64.7	25.9	5.2	2.0
Accept Null hypo.	Yes	Yes	Yes	Yes	Yes	No

Null hypothesis: Cluster One and Cluster Two come from the same population.

Fig. 288.

Dun Ardtreck

Cluster One and Cluster Two: NAA samples 421, 427, 434, 459, 426 and 436.
Next closest grouping: NAA samples 422.....438.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	<0.0	12.7	2.4	<0.0	2.5	1.0
Accept Null hypo.	No	Yes	No	No	No	No

Null hypothesis: Cluster One and Cluster Two come from the same population as the next closest grouping, samples 422.....438.

Fig. 289.

Dun Ardtreck

Cluster Three: NAA samples 422, 460 and 440.
Cluster Four: NAA samples 424, 444, 425, 428 and 431.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	21.1	49.7	51.0	<0.0	31.0	1.9
Accept Null hypo.	Yes	Yes	Yes	No	Yes	No

Null hypothesis: Cluster Three and Cluster Four come from the same population.

Fig. 290.

Dun Ardtreck

Cluster Three and Cluster Four: NAA samples 422, 460, 440, 424, 444, 425, 428 and 431.
Next closest grouping: NAA samples 423.....438.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	71.4	5.6	42.4	11.0	1.2	5.7
Accept Null hypo.	Yes	Yes	Yes	Yes	No	Yes

Null hypothesis: Cluster Three and Cluster Four come from the same population as the next closest grouping, samples 423.....438.

Fig. 291.

Dun Ardtreck

Cluster Five: NAA samples 423 and 433.
Cluster Six: NAA samples 437, 462 and 438.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	7.2	3.5	31.6	53.3	83.2	28.5
Accept Null hypo.	Yes	No	Yes	Yes	Yes	Yes

Null hypothesis: Cluster Five and Cluster Six come from the same population.

Fig. 292.

Dun Ardtreck

Cluster Seven: NAA samples 429, 435 and 439.
Cluster Eight: NAA samples 432, 442 and 443.

Element	La	Sm	Ce	Lu	Hf	Th
Two sample T test P.	58.2	96.5	3.2	15.2	47.3	1.2
Accept Null hypo.	Yes	Yes	No	Yes	Yes	No

Null hypothesis: Cluster Seven and Cluster Eight come from the same population.

Fig. 293.

Dun Ardtreck: Cluster Number 1

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
421	170	3 baulk V/IV	everted	row of finger tip impressions below rim, grass marked
427	140	3 trench V	-------	incised hatched lines
434	62	4 trench XIII	thick and everted	Possibly not Iron Age? coarse fabric
459	148	3 Dun int. ?	rolled and everted	possible lid ridge on the int., wheelmade Dark Age 'E' ware?

Fig. 294.

Dun Ardtreck: Cluster Number 2

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
426	68	3 trench IV	-------	horizontal rilling on exterior
436	215	3 tr/bau IX/V	-------	remains of a wavy cordon, one scored line

Fig. 295.

Dun Ardtreck: Cluster Number 3

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
422	210	3 tr/bau IX/V	-------	thin worn wavy cordon, perhaps a slip on the exterior
460	235	2/3 ramp	-------	base sherd of Roman coarse ware, grooved lines on exterior
440	46	2/3 trench IX	-------	rilled int., brushed ext.

Fig. 296.

Dun Ardtreck: Cluster Number 4

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
424	169	3 baulk V/IV	-------	applied wavy cordon
444	87	3 trench IV	everted and thin	incision gives effect of wavy cordon, chevrons above, ring pin stamps between chevrons
425	217	3 tr/bau IX/V	-------	thin wavy cordon
428	109	3 trench IV	-------	thin wavy cordon
431	211	3 tr/bau IX/V	-------	wavy cordon

Fig. 297.

Dun Ardtreck: Cluster Number 5

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
423	115	3 trench V	-------	wavy cordon
433	113	3 trench V	-------	black, burnished appearance

Fig. 298.

Dun Ardtreck: Cluster Number 6

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
437	21	2 trench IV	flat and everted	heavily grass marked
462	1	1 rubble	-------	base with thumb impression
438	98	3 trench V	-------	wavy cordon

Fig. 299.

Dun Ardtreck: Outlier Number 461

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
461	2	2 dun int.?	-------	small white and grey crucible

Fig. 300.

Dun Ardtreck: Cluster Number 7

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
429	18	2 trench VII	everted	wavy cordon, chevrons infilled with lattice, heavy grass marks
435	184	3 trench IV	everted	horizontal lines on the interior thumb inpress., curved lines
439	78	3 trench IV	sharply everted	----------

Fig. 301.

Dun Ardtreck: Cluster Number 8

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
432	187	3 trench IV	thin and everted	top of chevron below the rim, grass marks
442	25	2 trench IV	everted	row of stabs below rim, large zigzag lines, brush marked
443	84	3 trench IV	-------	heavy cordon, deeply slashed and several grooved lines

Fig. 302.

Dun Ardtreck: Outliers Number 430 and 441

Sam. Num.	App. Num.	Phase/Context Summary	Rim Type	Decorative or other features
430	188	3 trench IV	-------	worn wavy cordon, grass marked
441	186	3 trench IV	-------	chevrons formed by incised lines

Fig. 303.

370 BC to AD 220 for the site's construction, clearly this cannot be taken as proof of either site belonging to the 1st century BC or AD, or as evidence for this dun or of 'semibrochs' in general being broch progenitors as has been argued (MacKie 1969c, 56).

NAA results.

Fig. 285 shows the 28 sherds from Dun Ardtreck which were sampled by NAA and subsequently subjected to cluster analysis. The same sherds are shown in Fig. 286 to demonstrate that no one phase or context has its own separate significant cluster as defined by the 'twosample t' tests in Figs. 288-293. Eight clusters and 2 groups of outliers are identified as being significant, of the outliers NAA sample no. 461 is a small white and grey crucible which provides another example of clay based metalworking objects being different to the general pottery assemblages on sites. Two other samples demand comment, the piece of possible Dark Age 'E' ware is perhaps as likely to be part of a Scottish medieval vessel and it, and the single Roman sherd, demonstrate the lack of information which which can be obtained by drilling single samples of vessel types. The obtaining of samples from a variety of Roman vessels in the Western Isles would have proved much more informative because a single sherd can never be statistically satisfactory. Of the remaining purely Hebridean later prehistoric pottery, no more can be said other than there

are no identifiable patterns of phase or type in the clusters.

Chapter Ten: Discussion and conclusions

> 'Here, or even earlier, I should have finished this tearful history, this complaint on the evils of the age' (Gildas trans. 1978, 36).

In chapter one two previous approaches to the definition of typology and chronology in Hebridean later prehistoric ceramics were outlined. That advanced by Mrs. Young (1966) sought to identify the origin and development of early and later decorative features which she believed fitted a general pattern throughout the Hebridean chain. Dr. MacKie outlined a series of outwardly distinctive wares for which broad relative, and later absolute, dates were proposed (1971a; 1974). Variations which he thought could be traced through time were explained by diffusionist models which indicated influences from areas external to the Hebrides. The data which was used to support these hypotheses has been examined in the preceding eight chapters, with omissions, discrepancies and factual errors being identified where appropriate. Mrs. Young's sequence was largely based on that advocated by Sir Lindsay Scott for Clettraval (1948) and Dr. MacKie's upon his excavations at Dun Mor Vaul and to a lesser extent Dun Ardtreck. Specific points relating to these models have already been made in the relevant parts of previous chapters; an overview will now be attempted to assess the value of the approaches in the current context, although the lack of C^{14} dates and well defined stratigraphies is still a limiting factor.

Potential of pottery for defining chronology

With regard to Mrs. Young's sequence, incision was identified as one of the earliest decorative types, with this conclusion being based on Scott's analysis of the Clettraval pottery (Scott 1948, table 1). As demonstrated in chapter seven, however, this conclusion is no longer satisfactorily proven given the discrepancies of the extant sherds compared with Scott's analysis and given also the weaknesses of his statistical argument. The problem is both exacerbated by the small number of Hebridean sites with a well recorded stratigraphy (MacKie 1973, 123) and by the publication in full of only a few of those which once possessed such a potential. At Dun Mor Vaul, where a stratigraphic sequence of levels was recorded, incised sherds occurred in all phases of the site's usage (eg phase 1 nos. 36 & 39, in phase 5 no. 466). The C^{14} dates from this site, when calibrated, would quite happily give a 1000 year date range for the occurrence of incised decoration. Balelone also had incised vessels in the early occupation levels and in all others up to the surface deposits (eg. nos. 274, 494, 555 and 48-51). In the published site report of A Cheardach Mhor only the incised pottery occurring in the phase 1 deposits is illustrated, yet 3 sherds from different vessels in phase 3 were also incised (nos. 196-197 & 213).

If the argument that pure numbers of sherds or vessels in any one phase of any one site indicates changes in style were to be employed, it has to be demonstrated that such changes might not be merely due to fluctuations in the ratios of archaeological survival or to some vagary in the prehistoric society. It may be salutary to note that in Southern British Iron age contexts a sample size of 1000 sherds is considered too small to be of much statistical worth (Cunliffe 1984, 251). In the Hebrides only Dun Mor Vaul and Sollas have this number of extant sherds, whilst the paucity of detailed records from other sites is crucially detrimental to their value in the debate. It is thus only when a pattern is substantiated from a number of sites in the Western Isles, that a genuine trend may be argued. The evidence from Dun Mor Vaul, A Cheardach Mhor and Balelone, for which reasonable records exist, indicates that incision generally was not just an early decorative technique.

Another decorative feature to which Mrs. Young attributed a chronological label was the applied boss and this also was believed to be a Hebridean early Iron Age trait. Again this view was one orginated by Scott at Clettraval where 1 sherd with an applied boss was recovered from the lower levels. This, however, represented 1 vessel from 81 in the phase, whereas only 37 and 22 vessels were recovered from the middle and upper levels respectively. Statistically the recovery of a single sherd in the lower

levels cannot support the conclusion that applied bosses were specifically an early technique. Two sherds with applied bosses were recovered from A Cheardach Mhor and both are illustrated as coming from phase 1 on the site (Young and Richardson 1960, fig. 5 nos 17 & 18), yet in the text of the excavation report no. 18 is recorded as deriving from disturbed phase 5 deposits. Two sherds with applied bosses were recovered from Tigh Talamhanta (nos. 75 & 76), but although both have area contexts, bay 4/5 and the souterrain respectively, neither has an ascribed phase. Two further sherds with similar decoration were found during the excavation of Dun Iardhard, again their stratigraphic relationship is unknown and beads of both later prehistoric and early historic type were recovered. At Balelone 1 sherd with an atypical, small applied boss came from the pre structural levels. A C^{14} date for the early structural levels can be calibrated, with allowance for the reservoir effect of marine samples, to between 180 BC and AD 430. Thus it also cannot be used to prove that applying of bosses was an early decorative feature.

A third decorative type identified by Mrs. Young was the appearance of ring pin stamping during the later prehistoric period. It might be thought that this feature offered the greatest potential for the dating of sherds, since by its nature it must have been applied during a period in which such bronze pins were in circulation. It was, for example, dated by Mrs. Young to the 2nd century AD

(Young 1953, 104) and it does occur in the phase II/III deposits at Dun Ardtreck which also contain sherds of Roman samian and coarse ware. The date range, however, is broadened by the recovery of a number of such sherds at Dun Mor Vaul in phase 1A and 1B contexts. Calibration of C^{14} dates in these levels indicates a date possibly as early as the eighth century BC with a certainly a strong possibility of occurring before the 2nd or 3rd century BC. At the other end of the age range is a sherd from Eye, Lewis with ring pin stamping of a ring type not present in the Hebrides until the Viking period (Fanning 1983, 331). This raises the issue of the nature of the pins involved in the technique, clearly an important factor. Two distinct classes are identifiable: shouldered ring headed pins and pins whose head is moveable. The derivation of the latter from the former is no longer certain (Ibid, 330) with separate lines of evolution being a possibility. This has the consequence that the identification of the pin type from the impression on the sherd is all important and unfortunately in the majority of cases this cannot be satisfactorily established. In any event ring pin stamping has a wide potential period of usage, and thus may not be of as much value as once thought for the chronological definition of excavated sites.

These 3 and every other decorative type can be demonstrated to have a wide potential date range which perhaps lends support to MacKie's belief that the Hebridean pottery needs to be studied in terms of wares, that is

combinations of traits, rather than by individual characteristics. Alcock, however, as has been stated in previous chapters, has also advanced the view that bald similarities between pottery motifs in Southern Britain and the Hebrides do not imply a transference of complete ceramic traditions (1984, 15). Moreover the criteria for defining wares in the past have been subjective and it was in part for this reason that NAA was undertaken to determine if different vessel forms and decorative types had a corresponding correlation in their chemical composition. The work undertaken by Peacock on Southern British Glastonbury ware, for example, was re-examined by Blackmore, Braithwaite and Hodder who ruled that no correspondence existed between fabric and decorative style and that hence there was cross cutting between style and petrology (Anderson 1984, 127). In this instance, however, it was outlined that fabric analysis should be given the greater weighting in interpretation although petrology and typology are complementary offering different information on separate aspects of ceramic traditions (Ibid, 128).

In Dr. MacKie's pottery typology a distinction between incised wares and everted rim vessels was advocated. The earliest vessel type identified by him was the small cordoned vase which he envisaged as being descended from neolithic pottery in the islands. The examples he cited from Balevullin are of little value in chronological definition owing to the miscellaneous and varied nature of that

assemblage. Of more value is the example from the 1st century AD context at Dun Ardtreck, it is clear that if it does represent a discrete type, the cordoned vase has also such a broad period of manufacture as to be of little value in ascribing dates to sites where no other artefactual evidence exists. Another small vase type was Vaul ware which occurred at all levels throughout that site and which was a vessel form which included most of the incised pottery from the Western Isles, although at its most elaborate it occurred only on Tiree. Its occurrence in every phase at Dun Mor Vaul, emphasizes the over simplistic nature of the sequence which had been advanced by Sir Lindsay Scott and Mrs. Young for incised decoration as a technique. A third specific type which MacKie identified was 'Abernethy' or 'Dunagoil' ware on account of its recovery from mainland later prehistoric forts. It was recovered from the pre broch levels of Dun Mor Vaul and is typified by thick gritty vessels with a general bucket shape. It may well be wondered if such an unremarkable vessel type is really worth definition as a separate ware, especially as such vague features might more adequately be explained by function?

The other major wares which were identified by Mackie were all of everted rim type. He believed the earliest to be 'Clickhimin' ware on account of its occurrence in the pre broch levels of that site. Its essential characteristics were the distinctive everted rim which in addition possessed horizontal fluting on the rim's interior edge. MacKie

identified this vessel form as being the progenitor of all other Hebridean everted rim pottery and outlined a diffusionist model of its transference from western France through immigration. He proposed a date in the 1st century BC for the arrival of this trait in Atlantic Scotland (MacKie 1974, 159), largely upon the absence of everted rim pottery from the pre broch, phase 1 levels of Dun Mor Vaul. Mrs. Young considered in addition that everted rim pottery replaced the incised wares, however, this latter argument is no longer convincing, as outlined above.

It is unfortunate, if somewhat inevitable, that such a rigid pottery sequence is not convincingly borne out by the evidence. MacKie's contention that everted rim wares do not occur in the early levels of Dun Mor Vaul is contradicted by his own site report. An everted rim sherd was recovered from the epsilon 2, phase 1 A deposits (MacKie 1974, 38), although this is dismissed by him, is excluded from the illustrations of pottery and is subsequently ignored in his pottery discussion. A C^{14} date from roots in the epsilon 2 context can be calibrated to between 770 and 180 BC (Fig. 42) and while this sherd is a single example, it cannot be disregarded purely as a matter of convenience. Stratigraphically later was the everted rim, double cordoned vessel from Eta 2 (no. 90), a context for which a C^{14} date of 785 to 215 BC was recovered (Fig. 42) The implication from Dun Mor Vaul is that everted rim pottery occurs from the late 3rd or early 2nd century BC. An everted

rim sherd was also recovered from the level of early erosion pits at Balelone in phase 3b which were dated by a shell C^{14} sample to between 405 BC and 395 AD (Fig. 246). It thus at least has the potential for being pre 1st century although it could not seriously be advanced as evidence to support this hypothesis. A similar argument applies to the C^{14} date from Dun Ardtreck, which when recalibrated gives a date range of 370 BC to AD 220 (Fig. 287) for the site's construction. Everted rims and fluted everted rims occurred throughout phase 2. It is hard to reconcile the above evidence with MacKie's sequence derived from Clickhimin of fluted rims being the progenitors of the ordinary everted rims, especially since the fluted variety occur in their largest numbers at Dun Mor Vaul in the sigma deposits of phase 3b and 4 (eg. nos. 368-370) when ordinary everted rims are already commonplace.

Other vessel or decorative types were also identified by MacKie as having French and specifically Urnfield parallels and origins. Horizontal rilling on the exteriors of sherds was identified as one of these traits (MacKie 1971, 844). Several sites in the Hebrides have produced examples, although none can be demonstrated to be of the early date which might be expected if the Urnfield parallel is adhered to. At Dun Mor Vaul all the sherds were in the sigma phase 3B and 4 levels which contained Roman glass and pottery of Antonine date in the 2nd century AD. A sherd with very similar decoration was recovered from phase 3 contexts

of Dun Ardtreck. This was a level thought by the excavator to date not earlier than the 2nd century AD, also deduced on the basis of discovered Roman samian and coarse ware. An almost identical sherd from A Cheardach Mhor was identified as being a Mediterranean import by the excavators, it is now clear that it is not (Alcock 1984, 17). It was recovered from phase 4 of A Cheardach Mhor and although the exact stratification is ill defined, to envisage it as an Urnfield parallel would require an explanation of the many centuries time lag from a supposed continental origin.

Another of the supposed Urnfield decorative parallels (MacKie 1971, 844), although similarities with Late bronze Age vessels from Sussex have also been noted (MacKie 1974, 159), is the the occurrence of sherds with thumb impressed bases. Several of these were recovered from A Cheardach Mhor, although unfortunately none had a particularly secure position within the site stratigraphy. Two were excavated from the wheelhouse middens and while levels within these were given phases by the excavators, it is evident from the site section (Fig. 125) that the levels were not continuous and so the dating of the sherds to phase 1 of the site is not satisfactorily proven. Others of the type were excavated from the pre broch contexts of Dun Mor Vaul, from Dun Ardtreck in phase 2 and from the 3c level of habitation and structures at Balelone. While little may be proven, the existence of thumb impressed bases on these and other sites in the Hebrides, indicates the potential for a fairly

widespread chronological horizon and not just in the first millennium BC.

The remaining major everted rim style which Mackie noted was 'Clettraval' ware, so called by him because of its occurrence on that site. The distinctive features are the everted rim, an applied wavy cordon at the point of maximum girth of the vessel and a series of channelled curving arches above. As a decorative technique it was considered by Sir Lindsay Scott to have been one of the earlier rather than later vessel styles, with its use dying out at the end of the first phase at the Clettraval site. It is not known to have any parallels outwith the Hebrides and within the islands seems to have a distribution confined to the southern part of the chain. Its occurrence on wheelhouse excavations on the Uists, such as A Cheardach Mhor phase 1, led to its becoming labelled as 'wheelhouse ware', although the earliest context for which a date can now be provided is at Dun Mor Vaul. Sherd no. 118 at that site had a finger impressed cordon with channelled concentric and curvilinear decoration above, this is held to have affinities to 'Clettraval ware' and it was located in the theta 1 deposits. Context theta was a mixed early and later deposit containing material from phases 1 and 2 which lay on top of the raised rock surface in the north-western quadrant of the broch interior. The excavator assigned the pottery and other artefacts to phase 2A (Mackie 1974, 79), though this separate, pre broch phase was distinguished, not by

structural remains but rather, by the existence of newly occurring pottery types which he ascribed to the arrival of the 'fort builders'. The significance which can be attached to this supposedly separate phase depends on the degree of correlation one is prepared to see between subjectively different pottery styles and changing prehistoric populations. There is no doubt that some of the material derives from earlier contexts and although there is some indecision in the mind of the excavator (Ibid, 40, 41 and 79), it would appear that some also comes from later as well. No C^{14} dates were obtained for phase 2 or 2A deposits, although the context may be bracketed by those from earlier and later to give a range in the last 5 centuries BC to the first 3 centuries AD. Clearly this of little value in the chronological definition of the first occurrence of the decorative type although many examples of the style were recorded from the early broch contexts in the last and first 2 centuries BC and AD.

The end point in the 'Clettraval' ware sequence is equally hard to pinpoint, although at that site itself Scott asserted the characteristic decorative features was confined to only the lower levels. This in part relies on the dating for the associated hut, structure 'C' at Clettraval, and since this was dated by the pottery within it the argument involves circularity and cannot be deemed satisfactory. The sequence from Dun Mor Vaul was thought by the excavator to lead to a 'devolved' style in the phase 4b Beta deposits

from the mural galleries. These were dated by the recovery of Roman glassware of a late first, early second century AD type. MacKie argued that the channelling, which was the essential feature of Clettraval ware, was derived from the eyebrow ornamented Iron Age B bowls of Wessex, rather than from the more elaborate Glastonbury bowls as Scott had advocated. The Dun Mor Vaul Wessex bowl is one of several which occur in the Hebrides, although mainly in Tiree, and was labelled by the excavator as a 'memento pot' made for immigrant South Western British peoples arriving in the first century BC and recalling the styles made in their abandoned homelands (MacKie 1971b, 46). The imitation Wessex Iron Age B bowl was recovered from levels of primary use of the broch in phase 3a, that is stratigraphically later than some of the more typical 'Clettraval' ware sherds from the site and this apparent discrepancy was explained by the Wessex bowl having been kept as an heirloom before deposition. Such particularistic explanations will always be of dubious validity, more so if the evidence has to be strained to fit the proposed model. The arguments advanced by MacKie cannot be taken to define a starting point for 'Clettraval' ware, whilst an end point in any sequence will require a duplication of the pattern from more than one site, rather than the identification of processes of 'devolvement' or 'degeneration' from one excavation.

An endpoint for the Hebridean pottery sequence was seen by Mrs. Young in the vessels recovered from Dun Cuier. The

bulk of the pottery from the site was of plain flaring rim variety and was dated by her through the occurrence of bone combs and other materials on the site. No other comparable published assemblage occurs in the Hebrides, apart from the pottery from the small excavation within one of the chambers of Dun Carloway. There were no dateable artefacts from the latter site and the late C^{14} date is clearly not contemporary with the period of broch construction and main usage. It is particularly regretted that it was not possible to examine the Udal pottery because a phase of plain vessels was identified as beginning sometime after AD 400 (Ritchie and Lane 1981, 220). Dun Cuier clearly was in use in the early historic period, but the lack of detailed recording of find spots and stratigraphy, and indeed the discrepancies where they do exist, greatly reduce its value as providing the end of the pottery sequence. The sequence may be not a general one in any case, as no comparable pottery was found in the late levels of Dun Mor Vaul, which also extended into the early historic period.

It is a worrying aspect of Hebridean archaeology that the sequences and typologies which have been examined above are based on excavations of varying date and level of competence and that in any case the data base from which attempts are made to derive patterns is probably less that 20,000 sherds; less than one fifth of that recovered from a single hillfort, that of Danebury in Hampshire (Cunliffe 1984, 231).

The NAA results for the Western Isles

In chapters three to nine the NAA results from each site were considered individually; in this section they will be examined as a whole. It has been demonstrated in previous chapters that in general no one phase, context or vessel type had its own specific chemical composition exclusive to that group within the site. What remained to be examined, however, was if the results were distinctive site by site throughout the Western Isles chain. A dendrogram was produced which contained the reference clays and all the Hebridean sites for which most of the 9 elements used in clustering were recovered from every sherd. The dendrogram is shown in Fig. 304 and contains a total of 385 NAA samples. Of importance are the 2 clusters provided by the SURRC and by the IAEA reference clays. These were added to the Hebridean pottery dendrogram to prove that even with the large number of samples being considered, the techniques were still sensitive enough to pick out real groupings which existed within the data set. The 7 IAEA samples can be found in an exclusive cluster at the left hand side of the dendrogram, satisfactorily proving they are chemically distinct from the rest of the NAA samples. A similar pattern emerges for the SURRC reference clay samples which can also be found in an exclusive cluster, in this case about a third of the way from the y axis of the figure. These 2 results indicate that significant groupings can be found within the dendrogram and accordingly further examination was

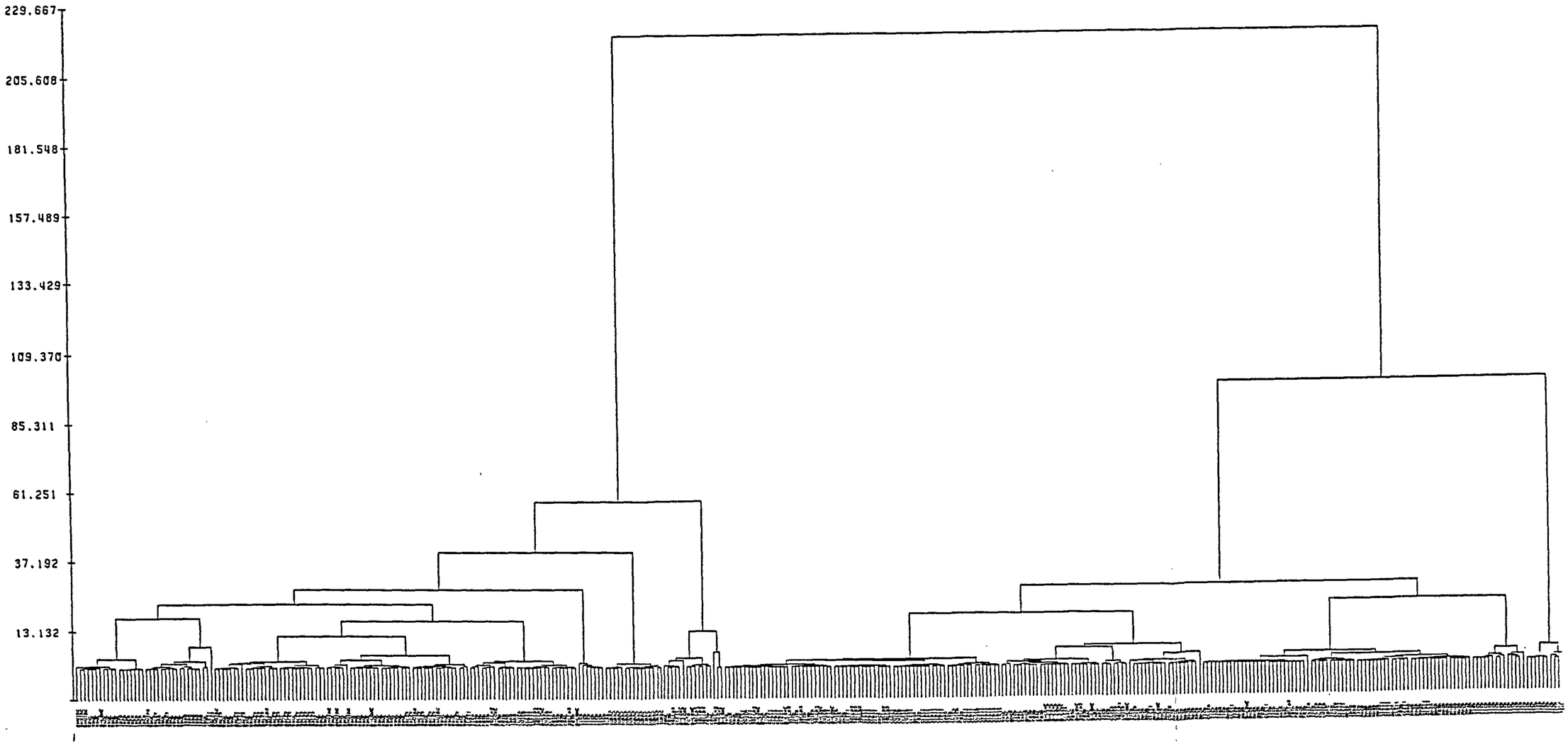


Fig. 304: Dendrogram of NAA samples from reference clays and from Hebridean sites, but excluding those for which full numerical data was not recovered.

undertaken to ascertain if any broader patterns which applied to the pottery sherds could also be discovered.

The first impression which may drawn from the dendrogram is that although most sites have sherds which form small groups of 5 to 6 sherds within larger clusters, there is no overall pattern of distinct archaeological sites possessing distinct clusters. However, a number of trends within the dendrogram can be noted, these are that the site of Tigh Talamhanta has 3 major clusters which, although not encompassing all the sampled sherds from the site, are virtually exclusive to Tigh Talamhanta, and secondly that there is a distinction between the more northerly and the southerly islands. The Tigh Talamhanta clusters can be found about one third of the way from the y axis on Fig. 304 and also on the extreme righthand edge. The implication of the dendrogram is that the bulk of the pottery from Tigh Talamhanta falls into 3 groups which each have a greater internal homogeneity within the assemblage than have other sites. A number of explanations which could account for this finding. One possibility is that the the clusters represent vessels which are distinctive in some way to that group, yet within the clusters there are no identifiable patterns of vessel form or decorative feature. Another explanation is that the diffentiation may be a chronological one. However, the clusters contain vessels from a variety of phases within the site's occupation and so this too must be rejected. A third is that that the raw clays which were utilised by the

later prehistoric population were in some geological way distinctive from the rest of the Hebridean chain. An examination of the NAA derived data for Tigh Talamhanta, however, does not reveal any obvious geological trend and the elemental concentrations can be paralleled from other parts of the Western Isles. A fourth explanation is that the sources for raw clays and the manufacturing techniques employed at Tigh Talamhanta were less variable than that those pertaining at other sites, it is for example possible that on some sites clays from different sources were mixed, as has been suggested in Southern Britain (Cunliffe 1984, 259). It is difficult to account for the pattern seen at Tigh Talamhanta archaeologically but perhaps the importance lies rather in the demonstration and implication that if such a pattern can be found on one site, then if it existed on others it ought to have been evident too.

The other major trend which is visible on the dendrogram in Fig. 304 is that there is a distinction between the chemical composition of the sherds from the islands of Iona and Tiree and those of the other islands. The distinction is a convincing one. At the 2 cluster level of the dendrogram it can be seen that all the 10 sherds from Dun Cul Bhuirg, the great majority of the sherds from Dun Mor Vaul (49 out of 52) and all the sherds from Balevullin fall into the lefthand of the major two clusters. That is, of the 87 sherds sampled from Iona and Tiree, 84 are in some way chemically different from those on the righthand side of

the dendrogram which comprises the bulk of the pottery from the Uists, from Lewis and from Skye. This finding is also mirrored by the analysis of the raw clays which was undertaken and the dendrogram from chapter two is reproduced in Fig. 305. The analysis indicates that the islands of Tiree and Iona are, in terms of clay composition, also largely different to others further to the north, although the anomaly of the clay from Balelone must also be noted. The general argument may be that the islands of Tiree and Iona were not receiving pottery from the islands further to the north.

Thus on the general Hebridean level two patterns are visible within the data, on the one hand the sherds from Tigh Talamhanta, and on the other the differentiation between the sherds from Tiree and Iona as opposed to those from more northerly islands. On a site specific level no pattern within sites could be seen apart from the two sherds from context 21 of Balelone and these were unusual in possessing very high levels of lanthanum and samarium. A recurring feature from site to site, however, was that some clay based objects connected with metalworking tended to be outliers within their own site distribution. This was the case for the ring headed pin mould from Sollas, for crucibles from Dun Beag and Dun Ardtreck and to to a lesser extent for the spear butt mould from Dun Mor Vaul. An explanation may be that more care in the selection of clays,

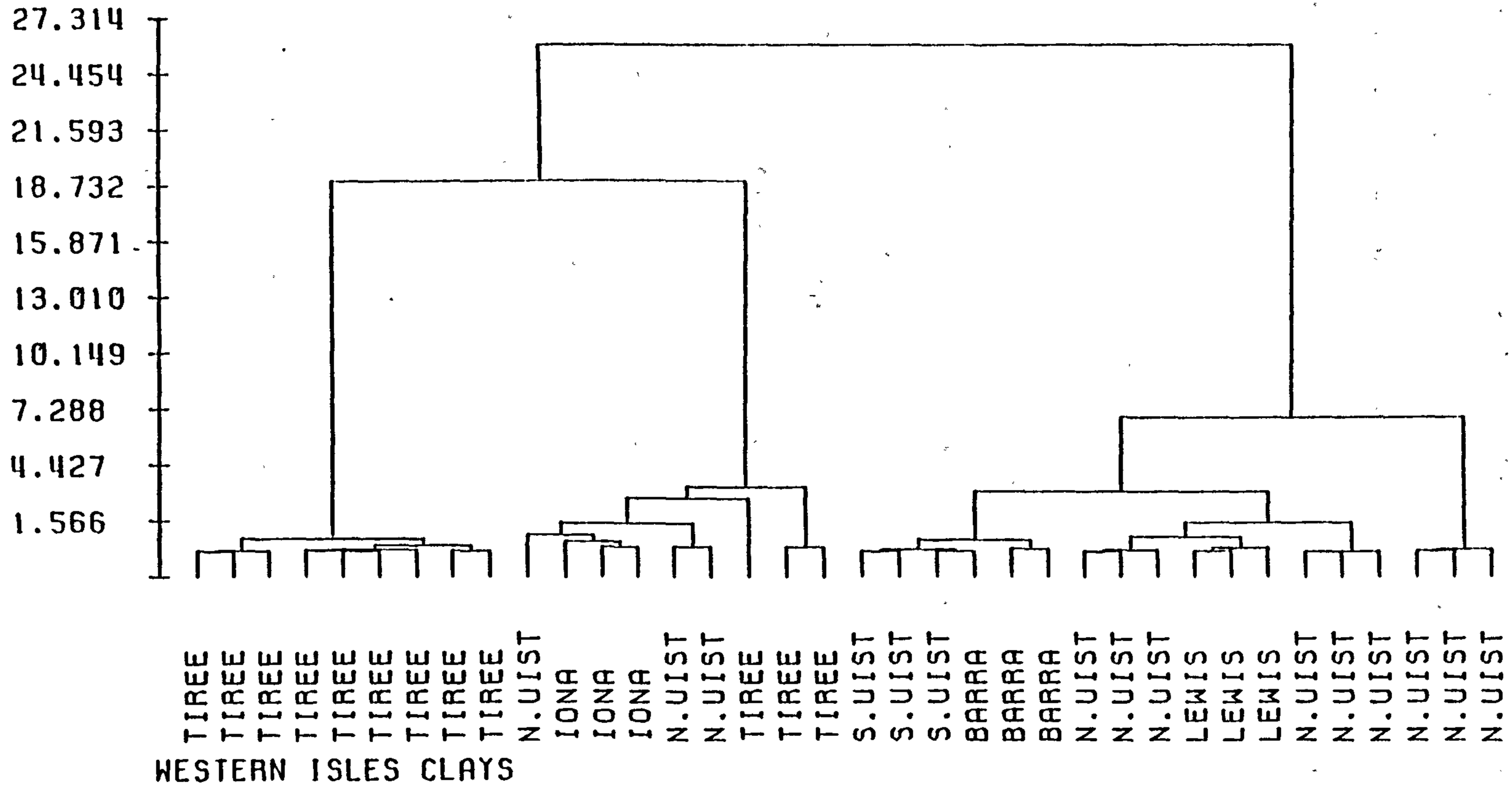


Fig. 305: Fig. 14 reproduced showing the clustering of the raw clays which were sampled by NAA.

or that more processing of the raw material is involved for the production of metal working objects. Clay moulds, for example, would not unreasonably have been made from a finer clay than that required for domestic use and their may be a hint that the nature and the level of pottery production is dependent upon the final function of the vessel, with different levels of manufacture for different end products.

Conclusion

If further work were to be carried out on NAA of ceramics from the Western Isles, the investigation of specific aspects of function, the multiple as opposed to single sampling of archaeological anomalies, and the selection of sherds from sealed and well contexted deposits would all be recommended. This approach would probably serve more useful function than the blanket analysing of sherds from sites whose poor stratigraphical excavation and recording systems have served to obscure patterns which may really underlie the data. An alternative line of investigation, and perhaps a complementary one, might be the examination of sherds from wider geographical and geological areas. This could demonstrate if the differentiation witnessed in the chemical composition of sherds between certain islands could be extended to other areas in which it may be postulated contact and interaction once existed- as an example Orkney and Shetland. Also worthy of investigation would be an attempt to analytically ascertain vessel function, this is an area which has not previously been

examined but one which ought not to be ignored in the future.

Three objectives were outlined for the sampling strategy at the beginning of the research programme. The major concern was to analyze the full range of Iron Age decorative and stylistic types, this was backed up by the taking of drillings from clay moulds and metal working crucibles and the final part of the study involved the sampling and analysis of clay taken from beds close to existing sites. These will be considered in reverse order. The NAA of Hebridean clay sources provided the test data set against which the potential of the clustering and statistical techniques could be tested. The results clearly show that both NAA and the subsequent statistical techniques were sensitive enough to recover real patterns which existed in the data and thus some degree of confidence could be given to the patterns recovered from the analysis of pottery sherds. The analysis of metalworking artefacts has suggested that the clay utilised was special in some way, either coming from a different source to that for more mundane vessels on sites, or that it was specially prepared to give a finer end product.

Finally the examination of the large number of pottery sherds from 15 sites throughout the Hebridean chain has demonstrated that no one vessel type or decorative feature and virtually no chronological context has a clay source and

potting technique which is exclusive to that archaeologically defined group. Patterns which are of uncertain definition do occasionally occur, as at Tigh Talamhanta, but the general implication which is drawn from the results is that later prehistoric pottery in the Western Isles was locally produced and locally distributed. This is suggested by the chemical differentiation between the sherds from the islands of Iona and Tiree against the rest of the chain, by the lack of correlation between chemical composition and vessel form and by the lack, apart from Dun Carloway, of identifiable pottery kilns and specialist pottery production centres. In this conclusion may lie the reason for the difficulty in defining Hebridean pottery typologies and chronologies, because without the uniformity of commercial or specialist production the relevance of classification may be limited (Harding 1974, 92), with patterns within the data being too ephemeral or too variable for secure archaeological identification.

References

Alcock, L 1984 'A Survey of Pictish Settlement Archaeology', British Archaeol R, British Series 125 (1984), 7-41.

Anderson, A 1984 Interpreting Pottery, Batsford, London.

Barnes, I 1984 'The analysis and re-creation of Bronze and Brass Mould Residues', in Bryce, T and Tate, J The Laboratories of the National Museum of Antiquities of Scotland. Edinburgh.

Beveridge, E 1903 Coll and Tiree, Edinburgh.

Beveridge, E 1911 North Uist, Edinburgh.

Bibby, JS, Hudson, G & Henderson, DJ 1982 Western Scotland, Macauley Institute for Soil Research, Aberdeen.

Binns, PE, McQuillin, R & Kenolty, N 1974 The geology of the Sea of the Hebrides, HMSO, London.

Bishop, RL, Rands, RL & Holley, GR 1982 'Ceramic Compositional Analysis in Archaeological Perspective', in Schiffer, MB (ed) Advances in Archaeological Method and Theory Volume 5, London: Academic Press.

Cabral, JMP, Gouveia, MA, Alarcao, AM & Alarcao, J 1983 'Neutron Acitivation of Fine Grey Pottery from Conimbriga, Santa Olaia and Tavarede, Portugal', J Archaeol Science 10 (1983), 61-70.

Calder, CST 1939 'Excavations of Iron-Age dwellings on the Calf of Eday, Orkney', Proc Soc Antiq Scot, 73 (1938-9), 167-185.

Callander, JG 1921 'Report on the excavation of Dun Beag, A Broch near Struan, Skye', Proc Soc Antiq Scot, 55 (1920-21), 110-131.

Campbell, E 1984 'E Ware and Aquitaine- a Reconsideration of the Petrological Evidence', Scot Archaeol Rev, 3, pt 1 (1984), 35-38.

Caulfield, S 1980 'Quern replacement and the origin of the brochs', Proc Soc Antiq Scot, 109 (1977-78), 129-139.

Cheape, H 1983, 'Crogans and Barvas Ware Pottery in the Islands', Stornoway Gazette, week ending Jan. 22nd 1983, 2.

Childe, VG 1935 The Prehistory of Scotland. London.

Clark, RM 1975 'A calibration curve for radiocarbon dates', Antiquity, 49 (1975), 251-266.

Clarke, DV 1971 'Small Finds in the Atlantic Province: Problems of Approach', Scot Archaeol Forum, 3 (1971), 22-54.

Close-Brooks, J 1979 'Small finds' in Tabraham, C 1979 'Excavations at Dun Carloway broch, Isle of Lewis', Proc Soc Antiq Scot, 108 (1976-77), 161-167.

Coomaraswamy, AK 1903 'Observations on the Tiree Marble, with notes on others from Iona', Quart J Geol Soc, 59 (1903).

Collins, GH 1981 'Petrological examination of pottery sherds', in Ritchie, GN and Lane, AM 'Dun Cul Bhuirg, Iona, Argyll', Proc Soc Antiq Scot, 110 (1978-80), 224.

Collis, J 1984 The European Iron Age, Batsford, London.

Cunliffe, B 1984 Danebury: an Iron Age Hillfort in Hampshire, vol 2, Council for British Archaeology Research Report no 52.

Curle, J 1932 'An inventory of objects of Roman and Provincial Roman origin found on sites in Scotland not definitely associated with Roman constructions', Proc Soc Antiq Scot, 66 (1931-32), 277-397.

Davidson, TE 1977 Regional Variation within the Halaf Ceramic Tradition, PhD thesis, University of Edinburgh.

Deer, WA, Howie, RA & Zussman, J 1980 An Introduction to the Rock Forming Minerals, 12th. imp., London.

Dickson, CA 1981 'Grain impressions and charcoal identification', in Ritchie, GN and Lane, AM 'Dun Cul Bhuirg, Iona, Argyll', Proc Soc Antiq Scot, 110 (1978-80), 224-225.

Drury, SA 1974 'Chemical changes during retrogressive metamorphism of Lewisian granulite facies rocks from Coll and Tiree', Scot J Geol, 10 part 3 (1974), 237-256.

Everitt, B 1981 Cluster Analysis, 2nd. ed. London.

Fairhurst, H 1971 'The Wheelhouse site A' Cheardach Bheag on Drimore Machair, South Uist', Glasgow Archaeol J, 2(1971), 72-106.

Fanning, T 1983 'Some Aspects of the Bronze Ring Pin in Scotland', in O'Connor, A & Clarke, DV From the Stone Age to the 'Forty-Five, Edinburgh.

Flinn, D 1978 'The glaciation of the Outer Hebrides', Geol J, 13 (1978), 195-199.

Flinn, D 1980 'The Glaciation of the Outer Hebrides: Reply', Scot J Geol, 16 (1) (1980), 85-86.

Geikie, J 1873 'On the glacial phenomena of the Long Island or Outer Hebrides', J Geol Soc, 29 (1873), 532-545.

Gildas c. 540 The ruin of Britain, translated by Winterbottom, M 1978. Phillimore, London.

Glentworth, R 1979, 'Observations on the soils of the Outer Hebrides', Proc Roy Soc Edin, 77b (1979), 123-137.

Goudie, G 1917 'An underground Gallery recently discovered in the Island of Tiree', Proc Soc Antiq Scot, 51 (1917), 100-107.

Graham, A 1947 'Some Observations on the Brochs', Proc Soc Antiq Scot, 81 (1946-47), 48-99.

Guido, M 1978 The Glass Beads of the Prehistoric and Roman Periods in Britain and Ireland. London.

Harding, DW 1974 The Iron Age in Lowland Britain, Routledge and Kegan Paul, London.

Harding, DW 1984 'The Function and Classification of Brochs and Duns', in Miket, R and Burgess, C Between and beyond the walls. Edinburgh.

Jehu, TJ & Craig, RM 1923 'Geology of the Outer Hebrides. Part 1.- The Barra Isles', Trans Roy Soc Edin, 53 part 2 (1923), 419-441.

Johnson, S 1817 A journey to the Western Islands of Scotland, reprinted Stanhope Press, Glasgow.

Kilbride-Jones, HE 1938 'Glass armlets in Britain', Proc Soc Antiq Scot, 72 (1937-38), 366-395.

Klein, J, Lerman, JC, Damon, PE, & Ralph, EK 1982 'Calibration of radiocarbon dates: tables based on the consensus data of the Workshop on Calibrating the Radiocarbon timescale', Radiocarbon, 24(2) (1982), 103-151.

Knox, J 1787 A Tour through the Highlands of Scotland, the Hebride Isles, in 1786. London.

Krywonos, W, Newton, GWA & Robinson, VJ 1980 'Neutron Activation Analysis of Roman Coarse Ware from Cyrenaica', Archaeometry, 22 (1980), 189-196.

Lethbridge, TC 1952 'Excavations at Kilpheder, South Uist and the Problem of the Brochs and Wheelhouses', Proc Prehist Soc, 18 (1952), 176-93.

Macculloch, J 1819 A Description of the Western Islands of Scotland.

MacGregor, A 1976 'The Broch of Burrain, North Ronaldsay, Orkney', Proc Soc Antiq Scot, 105 (1972-74), 63-118.

MacGregor, M 1976 Early Celtic Art in North Britain, Leicester University Press.

Mackie, EW 1963 'A dwelling of the earlier Iron Age at Balevullin, Tiree, excavated in 1912 by A. Henderson Bishop', Proc Soc Antiq Scot, 96 (1962-63), 155-183.

MacKie, EW 1965a 'The Origin and Development of the Broch and Wheelhouse Building Cultures of the Scottish Iron Age', Proc Prehist Soc, NS 31 (1965), 93-146.

MacKie, EW 1965b 'Brochs and the Hebridean Iron Age', Antiquity, 39 (1965), 266-278.

MacKie, EW 1969a 'Radiocarbon Dates and the Scottish Iron Age', Antiquity, 43 (1969), 15-26.

MacKie, EW 1969b 'Timber-laced and Vitrified Walls in Iron Age Forts: Causes of Vitrification', Glasgow Archaeol J, 1 (1969), 69-71.

MacKie, EW 1969c 'The Historical Context of the Origin of the Brochs', Scot Archaeol Forum, 1 (1969), 53-59.

MacKie, EW 1971a 'The Iron Age Pottery of the Scottish Western Isles', Actes du VIIe Congres International des Sciences Prehistoriques Protohistoriques, Prague, 1966, ed J Filip, Prague.

MacKie, EW 1971b 'English Migrants and Scottish brochs', Glasgow Archaeol J, 2 (1971), 39-71.

MacKie, EW 1973 The Origin and Development of the Broch and Wheelhouse Building Cultures of the Scottish Iron Age, unpublished PhD thesis, University of Glasgow.

MacKie, EW 1974 Dun Mor Vaul: an Iron Age broch on Tiree. Glasgow.

MacKie, EW 1979 'The origin of iron-working in Scotland', Fifth Atlantic Colloquium, ed. Ryan, M.

MacKenzie, WM 1904 'Notes on certain Structures of Archaic type in the Island of Lewis- Beehive houses, Duns and Stone Circles', Proc Soc Antiq Scot, 38 (1904???

Macleod, FT 1915 'Notes on Dun Iardhard, a broch near Dunvegan, excavated by Countess Vincent Baillet de Latour, Uiginish Lodge, Skye', Proc Soc Antiq Scot, 49 (1914-15), 57-70.

McNichol, D 1817 'Remarks on Dr Samuel Johnson's Journey to the Hebrides', in Johnson, S A journey to the Western Isles of Scotland, reprinted Stanhope Press, Glasgow.

MacSween, A 1982 'A study of Iron Age settlement on the Isle of Skye', University of Edinburgh, unpublished M.A. dissertation.

Mann, M 1906 'Notes on the Exploration of the Floor of a Prehistoric Hut in Tiree', Proc Soc Antiq Scot, 40 (1905-06), 372-378.

Martin, M 1716 A description of the Western Islands of Scotland. 2nd ed. London.

Martlew, R 1982 'Experimental firings using peat at the Dun Flodigarry excavations, Skye', Bull Experimental Firing Group, 1 (1982), 31-36.

Mate, I 1982 'Physical Background' in Barber, JW 'Excavation on Iona, 1979', Proc Soc Antiq Scot, 111 (1981), 282-287.

Mitchell, A 1880 The Past in the Present, Edinburgh.

Nennius, c. 9th century Historia Brittonum, translated by Morris, J 1980, Phillimore, London.

Noddle, B 1981 'Animal bone from Dun Cul Bhuirg, Iona', in Ritchie, GN and Lane AM 'Dun Cul Bhuirg, Iona, Argyll', Proc Soc Antiq Scot, 110 (1978-80), 225-227.

Peach, BJ & Horne, J 1930 Chapters on the Geology of Scotland. London.

Perlman, I & Asaro, F 1969 'Pottery Analysis by Neutron Activation', Archaeometry, 11 (1969), 21-53

Phemister, J 1948 Scotland: The Northern Highlands. British Regional Geology, 2nd. ed., Edinburgh.

Raftery, B 1981 'Knobbed Spearbutts of the Irish Iron Age', in Scott, BG 1981 Studies on Early Ireland: Essays in Honour of M.V. Duignan, Belfast.

Ralph, EK, Michael, HN & Han, MC 1973 'Radiocarbon dates and reality', MASCA Newsletter, 9 no. 1 (1973).

RCAHMS 1928 Royal Commission on Ancient and Historical Monuments of Scotland, Outer Hebrides, Skye and the Small Isles. Edinburgh.

Ritchie, JNG & Lane, AM 1981 'Dun Cul Bhuirg, Iona, Argyll', Proc Soc Antiq Scot, 110 (1978-80), 209-229.

Ritchie, W 1966 'The Post-glacial Rise in Sea-level and Coastal Changes in the Uists', Trans Inst Brit Geog, 39 (1966), 79-86.

Ritchie, W 1979 'Machair development and chronology in the Uists and adjacent islands', Proc Roy Soc Edin, 77b (1979), 107-122.

Rynne, E 1983 'Some Early Iron Age Sword Hilts from Ireland and Scotland', in O'Connor, A & Clarke, DV From the Stone Age to the 'Forty-Five, Edinburgh.

Scott, Sir L 1948 'Gallo-British colonies. The Aisled Round-House Culture in the North', Proc Prehist Soc, 14 (1948), 46-125.

Shetelig, H 1940 Viking Antiquities of Great Britain and Ireland, Oslo.

Shotton, FW & Hendry, GL 1979 'The Developing Field of Petrology in Archaeology', J Archaeol Science, 6 (1979), 75-84.

Sissons, JB 1980 'The Glaciation of the Outer Hebrides', Scot J Geol, 16 (1) (1980), 81-84.

Smith, DI & Fettes, DJ 1979 'The geological framework of the Outer Hebrides', Proc Roy Soc Edin, 77b (1979), 75-83.

Stevenson, RBK 1955 'Pins and the chronology of brochs', Proc Prehist Soc, 21 (1955), 282-294.

Stevenson, RBK 1956 'Native bangles and Roman glass', Proc Soc Antiq Scot, 88 (1954-56), 208-221.

Tabraham, C 1979 'Excavations at Dun Carloway broch, Isle of Lewis', Proc Soc Antiq Scot, 108 (197-77), 156-167.

Thomas, FWL 'On the Duns of the Outer Hebrides', Arch Scotica, 5 pt 3 (1890), 365-415.

von Weymarn, JA 1979 'A new concept of glaciation in Lewis and Harris', Proc Roy Soc Edin, 77b (1979), 97-105.

Wishart, D 1982 Clustan, Program Library Unit, Edinburgh University.

Young, A 1953 'An Aisled Farmhouse at the Allasdale, Isle of Barra', Proc Soc Antiq Scot, 87 (1952-53), 80-105.

Young, A 1956 'Excavations at Dun Cuier, Isle of Barra', Proc Soc Antiq Scot, 89 (1955-56), 290-328.

Young, A 1958 'A bronze pin from South Uist', Ant J, 38 (1958), 92-94

Young, A 1964 'Brochs and Duns', Proc Soc Antiq Scot, 95 (1961-62), 171-198.

Young, A 1966 'The sequence of Hebridean pottery', in Rivet, ALF (ed), The Iron Age in Northern Britain, Edinburgh: Edinburgh University Press.

Young, A & Richardson, KM 1960 'A' Cheardach Mhor, South Uist', Proc Soc Antiq Scot, 93 (1959-60), 135-173.